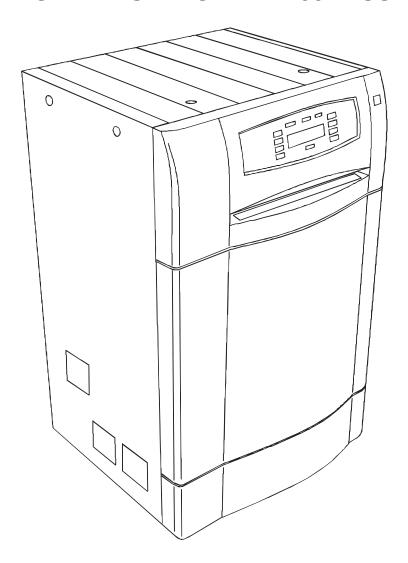


SERVICE MANUAL for the KODAK MULTILOADER 700 and KODAK MULTILOADER 700 PLUS



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TABLE OF CONTENTS

ELECTROSTATIC DISCHARGE	
SAFETY WARNINGSCHAPTER 1	
DIFFERENCES BETWEEN ML700 PLUS AND ML700	
CHAPTER 2	
REPLACEMENTS	2-3
REPLACEMENT COMPRESSOR ASSY M9	2-3
REPLACEMENT COMPRESSOR DIAPHRAGM	2-4
REPLACEMENT CASSETTE TRANSPORT MOTOR M1	2-5
REPLACEMENT CASSETTE OPENING MOTOR M3	2-7
REPLACEMENT CASSETTE CENTRING MOTOR M2	2-8
REPLACEMENT MAGAZINE OPENER MOTOR M6	2-14
REPLACEMENT FILM POCKET MOTOR M7	2-15
REPLACEMENT VACUUM PUMP CASSETTE M11	2-17
REPLACEMENT VACUUM PUMP MAGAZINE M10	2-20
REPLACEMENT STEPPER MOTOR M8	2-23
REPLACEMENT CASSETTE UNLOADING MOTOR M4	2-24
REPLACEMENT FILM TRANSPORT MOTOR M5	2-26
REPLACEMENT FILM POCKET ASSY	2-27
REPLACEMENT OF FILM POCKET TORSION SPRINGS for ML700 up to SN 2022 (50 Hz) and 5931 (60Hz) if Modification 19 is not installed	2-31
REPLACEMENT OF FILM POCKET CLUTCH SPRING for ML700 Plus and for ML700 with Modification 19 installed	2-33
REPLACEMENT MAGAZINE SUCKERS	2-35
REPLACEMENT MAGAZINE SUCKER BAR	2-37
REPLACEMENT TRANSPORT BELT	2-40
REPLACEMENT CASSETTE SUCKERS	2-44
REPLACEMENT TRANSPORT SHAFT ASSY	2-45
REPLACEMENT TRANSFORMER T1	2-47
REPLACEMENT OF PRINTER	2-48
CHAPTER 3	3-1
INFILL PANEL REPAIR KIT 9289936	3-1

	MAGAZINE DOOR SPRING REPAIR KIT 9280706	3-2
	PRINTED CIRCUIT BOARD A0 PN 9189070	3-4
	VACUUM PUMP REPAIR KIT FOR ML700 / ML700 Plus PN 9285706	3-5
	TUNNEL SENSOR TSF / TSR REPAIR KIT PN 9194426	3-6
	FILM OUT OF CASSETTE SENSOR FOC	
	REPAIR KIT 9194416 (Intermediate version)	3-8
	EXIT DOOR SPRING ML700 Plus ONLY	
CI	HAPTER 4	
	LINE VOLTAGE SETTING:	
	POWER SUPPLY MAGAZINE OPENER	
	MAGAZINE OPENER PHOTO SENSORS B21 (MMC), B20 (MMO)	
	CASSETTE ENTRY	
	CASSETTE INDUCTIVE SENSORS B28, B29	
	CASSETTE SUPPORT	
	CASSETTE TRANSPORT	
	CASSETTE BELT MOTOR M1	
	CASSETTE END SWITCH S13 (CES)	
	CASSETTE CENTRING MOTOR M2	
	CASSETTE CENTRING BRAKE (ML700 without Mod 26)	
	CASSETTE CENTRING BRAKE (ML700 with Mod 26 and ML700 Plus)	
	CASSETTE CENTRING BARS	
	CASSETTE CENTRING STOP SWITCHES S14/15 (CCS)	
	CASSETTE CENTRING	4-17
	CASSETTE WIDTH S2 (CW0), S3 (CW1) CASSETTE OPEN S1 (CO)	4-18
	CASSETTE LENGTH DETECTION	
	CASSETTE CENTRING CLUTCH	4-22
	CASSETTE OPENER OPENER LENGTH ADJUSTMENT	4-23
	ADJUSTMENT OF CASSETTE SUCKER BAR (ML700 without Mod 28)	4-37
	ADJUSTMENT OF CASSETTE SUCKER BAR (ML700 with Mod 28 and ML700 Plus)	
	CASSETTE BLOW PIPES	

	CASSETTE FILM PRESENCE DETECTOR and CASSETTE TYPE 2 SENSOR	4-49
	FILM OUT OF CASSETTE SENSOR B6 (FOC) ML700 only (old style version)	4-51
	FILM OUT OF CASSETTE SENSOR B6 (FOC) ML700 only (intermediate style version PN 9194416)	4-52
	FILM OUT OF CASSETTE SENSOR B6 (FOC) ML700 only (new style version PN 9284356)	4-55
	FILM OUT OF CASSETTE SENSOR B6 (FOC) ML700 Plus only	4-57
	FILM POCKET ADJUSTMENT	4-59
	PARALLELISM OF THE FILM POCKET DRIVE SHAFT.	4-59
	POSITION OF MAGAZINE SUCKER BAR.	4-61
	ADJUSTMENT OF FILM POCKET TIMING DISKS	4-65
	FILM REJECTER BRACKET	4-68
	MAGAZINE EMPTY SENSOR	4-69
	FILM POCKET STEPPER MOTOR M8	4-70
	FILM POCKET STEPPER MOTOR SPROCKET	4-71
	FILM POCKET CHAIN LENGTH	4-72
	FILM POCKET REFERENCE POSITION	4-72
	DOUBLE FILM SENSOR B14 (DFS)	4-75
	DOUBLE FILM SENSOR B14 (DFS) ML700 Plus	4-77
	TUNNEL SENSOR REAR B7 (TSR)	4-80
	TUNNEL SENSOR FRONT B8 (TSF)	4-81
	TUNNEL SENSOR TSF / TSR (ML700 only) REPAIR KIT 9194426	4-82
	PNEUMATIC SYSTEM CASSETTE	4-83
	PNEUMATIC SYSTEM FILM POCKET	4-85
	ADJUSTING HUMIDIFIER PCB A16	4-87
CI	HAPTER 5	5-1
	PREVENTIVE MAINTENANCE	5-1
CI	HAPTER 6	6-1

ESD SM 3053-3

ELECTROSTATIC DISCHARGE

OVERVIEW

ESD—electrostatic discharge—is a primary source of:

- product downtime
- lost productivity
- costly repairs.

While we cannot even feel a static charge of less than 3,500 volts, as few as 30 volts can damage or destroy essential components in the electronic equipment upon which you rely. As technology continues to advance, these advanced components will be even more vulnerable to ESD destruction. The conclusion is clear. To take charge of productivity and profitability, you must take care of ESD, now. Effective ESD control requires the following things.

AWARENESS

Everyone in your organisation needs to be aware of ESD, because partial ESD control is no ESD control at all. Everyone needs to remember that:

- ESD is a primary source of frustrating equipment failures and intermittent malfunctions.
- ESD affects productivity and profitability.
- ESD can be controlled.

ACTION

To take charge of ESD, you must take action. And that means everyone from senior management to the evening security crew.

- If you repair and maintain electronic equipment, it means always wearing grounding straps and working at ESD-protected sites.
- If you ever work around electronic equipment, it means keeping static generators like plastic trash bags away from sensitive components.
- For everyone, taking charge of ESD means making the simple ESD controls a way of life. (See the following sections for special tips).
- EFFECTIVE ESD CONTROL IS EVERYONE'S RESPONSIBILITY.

EVERY DAY

- Put trash in its place. And that place is away from static-sensitive equipment. Plastic materials, like trashcan liners and plastic foam cups, generate the static electricity that damages or destroys electronic components.
- Look for the label. Static-sensitive components are marked with bright graphic labels.
 Look for these labels. Follow label directions.
- Spray the carpet. ESD that is generated when you walk over carpet is a major culprit in component destruction. In some cases, especially in low-humidity environments, you may need to periodically spray carpets with an anti-static preparation, available at local stores.

SM 3053-3 ESD

DURING MAINTENANCE AND REPAIR

• Wear a grounding strap when you deal with static-sensitive components. Always make certain that the clip is attached to a properly grounded, unpainted surface.

- Use a portable grounding mat if you cannot repair components at an ESD-protected workstation. (Kodak's Customer Equipment Services Division can assist you in setting up ESD-protected workstations.)
- Use protective packaging when you transport components from one area to another. Transparent anti static bags, available from a variety of manufactures, shield your just-repaired components from further damage.

SAFETY WARNINGS

- DISCONNECT THE POWER WHEN TAKING OUT OR INSTALLING THE POWER SUPPLY. IT IS POSSIBLE TO TOUCH DANGEROUS VOLTAGE.
- IF YOU TAKE OUT SAFETY COVERS OR WIRE TIES TO HAVE EASIER ACCESS TO PARTS, INSTALL THEM BEFORE YOU MOUNT THE SIDE PANELS WHEN THE SERVICE CALL OR THE PM IS FINISHED.
- BE CAREFUL WHEN WORKING ON CIRCUIT BOARD A4.. THERE ARE 220 VAC ON THIS BOARD. AN ELECTRIC SHOCK MAY RESULT.
- After a SERVICE CALL or a PREVENTIVE MAINTENANCE check the electrical safety of the MULTILOADER. Follow your local and national regulations. Ensure that all PANELS are mounted properly.

CHAPTER 1

DIFFERENCES BETWEEN ML700 PLUS AND ML700.

DOUBLE FILM SENSOR

A DOUBLE FILM SENSOR similar to the ML300 is used. It measures the thickness and not the transparency of the film. This DOUBLE FILM SENSOR cannot be retrofitted into the ML700.

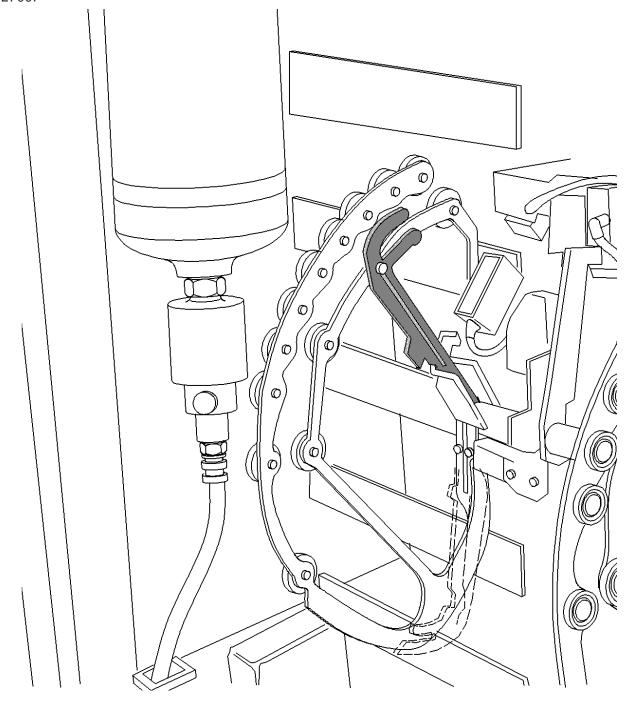


figure 1-1

CONVEYER END STOP

A CONVEYER END STOP is installed. This END STOP eases the correct positioning of the CONVEYER in case that the complete assembly had been removed from the ML700 PLUS. The END STOP is retrofittable into the ML700. It is part of Modification 28.

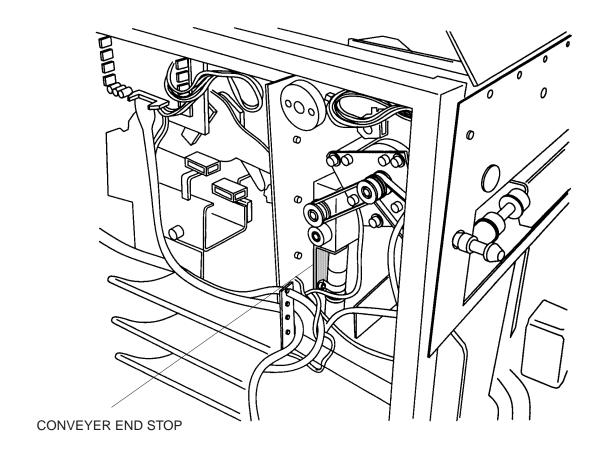


figure 1-2

CASSETTE SUCKER BAR GUIDE ROLLER and CASSETTE SUCKER BAR

The position of the CASSETTE SUCKER BAR GUIDE ROLLER can be easily adjusted with an ADJUSTMENT SCREW.

The new CASSETTE SUCKER BAR can be pivoted to match automatically the curvature of the CASSETTE. This improves the picking up of the film from the CASSETTE. See the drawing on the next page.

Both alterations are available as Modification 28 for the ML700.

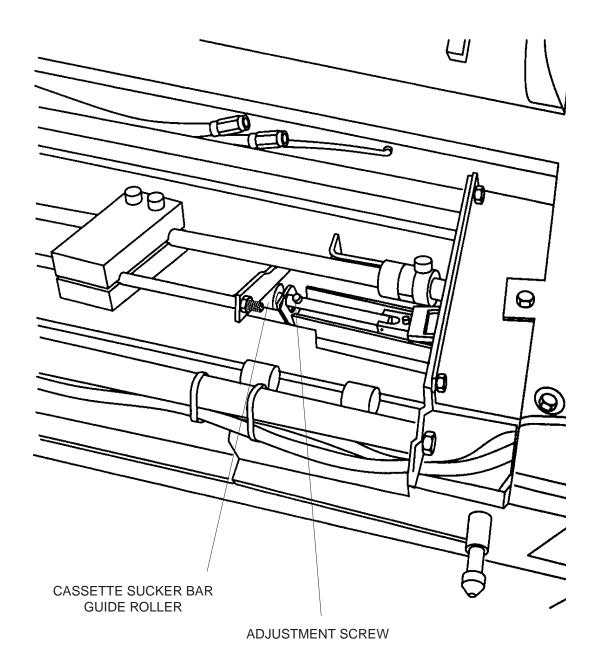


figure 1-3

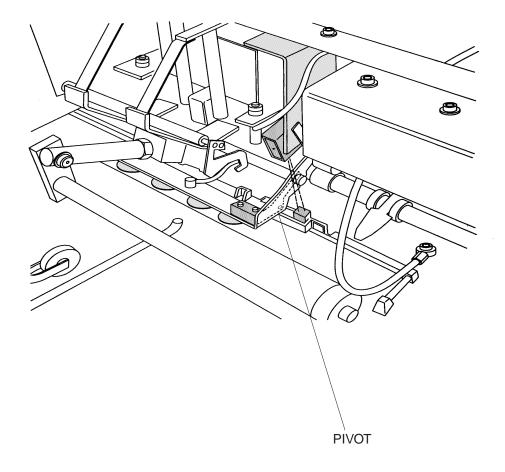


figure 1-4

FILM POCKET DETENT SPRING

A stronger FILM POCKET DETENT SPRING is used to hold the FILM POCKET in place. This alteration is available as part of Modification 28 for the ML700.

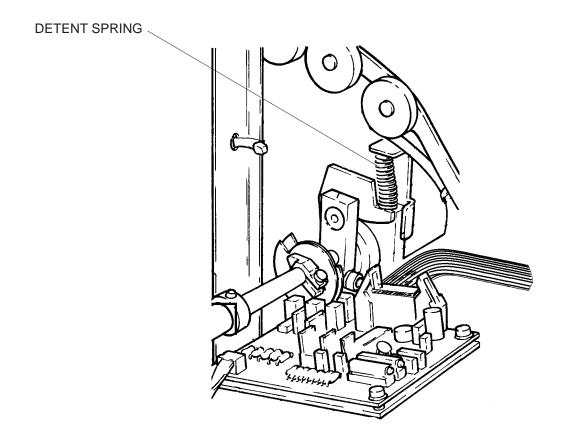


figure 1-5

CENTRING BRAKE

BRAKE BELT TENSIONERS are used in addition to the BRAKE BELT. The braking force is adjustable with an ADJUSTMENT NUT.

This alteration is available as Modification 26 for the ML700.

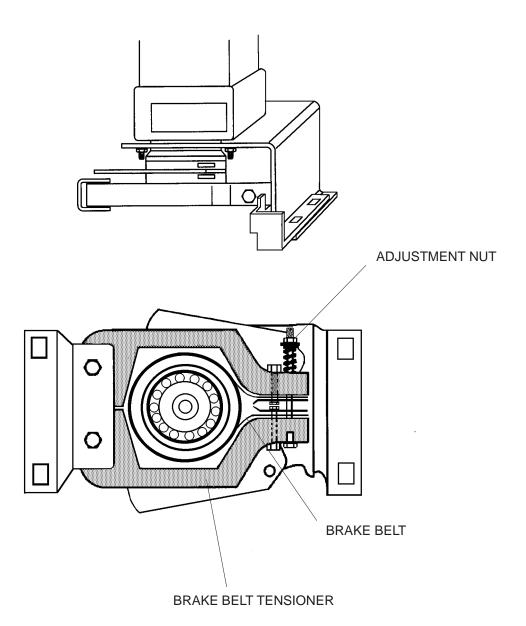


figure 1-6

MAGAZINE DOOR SOLENOID / MAGAZINE DOOR INTERLOCK

Instead of 2 DOOR SOLENOIDS just 1 is used at a different position. A new DOOR INTERLOCK SWITCH is used too.

These alterations are not retrofittable to the ML700.

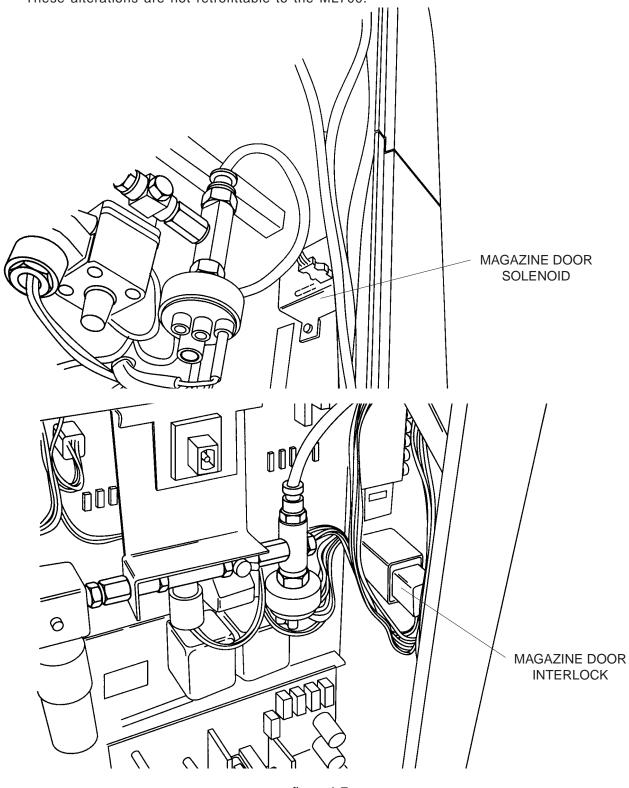


figure 1-7

DISPLAY



This DISPLAY has no SELF TEST FUNCTION.

The PLASMA TUBE DISPLAY is replaced with a LCD DISPLAY.

This alteration is not retrofittable to the ML700.

SPACER OPENER SHAFT

A SPACER at the OPENER SHAFT prevents it from excessive vibrations. Due to the strong vibrations SWITCHES S4, S5, S6 could become actuated at the wrong time.

This alteration is available as MODIFICATION 25 for the ML700

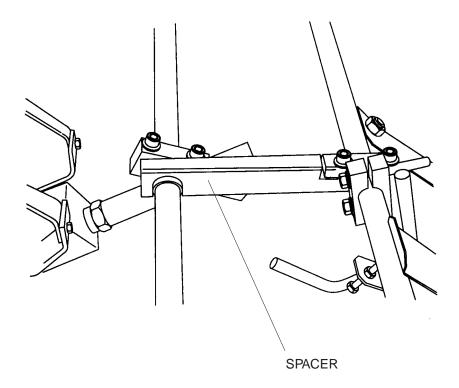


figure 1-8

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TOTAL CYCLE COUNTER

The TOTAL CYCLE COUNTER is relocated. The COUNTER can be accessed after lifting the TOP COVER.

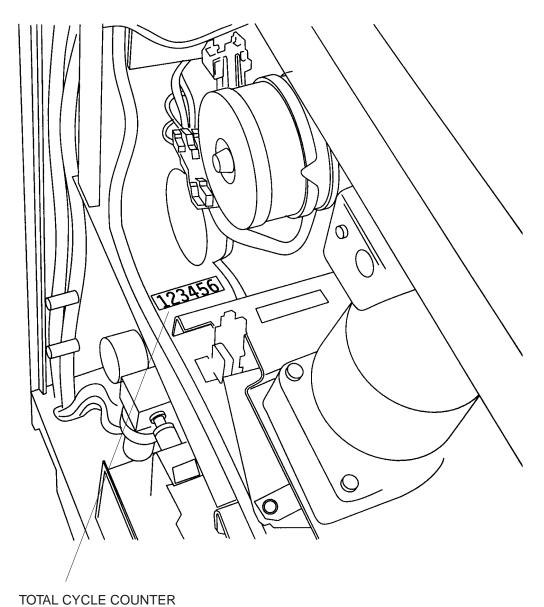


figure 1-9

PANELS

The PANELS are changed. Material and shape is changed. The Panels are fixed with QUARTER TURN SCREWS. To release the PANEL turn the SCREWS ¼ turn ccw. To fix the PANEL turn the SLOT of the SCREW vertical and then just press on the SCREW HEAD. The Panels are not retrofittable to the ML700.

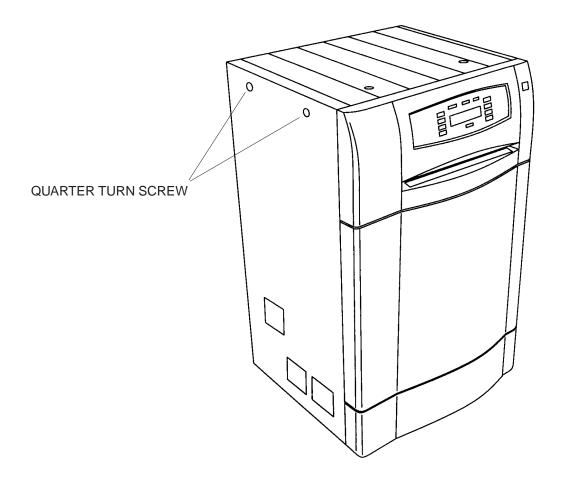


figure 1-10

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HUMIDIFIER

To increase the efficiency of the HUMIDIFIER the air flow is changed. With the new design, air is sucked out of the ML700, routed through the HUMIDIFIER and blown back into the ML700. It is now possible to raise the humidity up to 40%. The factory setting is 40%. This alteration is available as Modification 27 for the ML700.

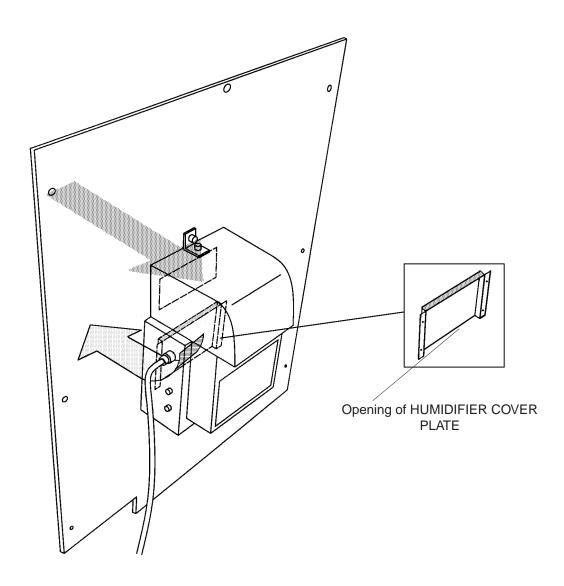


figure 1-11

POWER SUPPLY

An improved POWER SUPPLY is installed. This Power Supply does not become a modification for the ML700. If the POWER SUPPLY of the ML700 fails order the new one from the ML700 PLUS as a spare part.

TEMPLATES

The LCD DISPLAY of the ML700 PLUS differs in size from the PLASMA DISPLAY of the ML700. Therefore the old templates (used for diagnostics and sensor test) cannot be used for the ML700 PLUS.

TEMPLATE ML700 PLUS ML700

PART NUMBER TL 5089

COMPRESSOR

The old COMPRESSOR is replaced with a new one. The new one has an increased life time and is muchquieter. With the new COMPRESSOR it takes approximately 40 seconds to fill up the AIR BOTTLE. The new COMPRESSOR can be installed on both the ML700 and ML700 Plus.

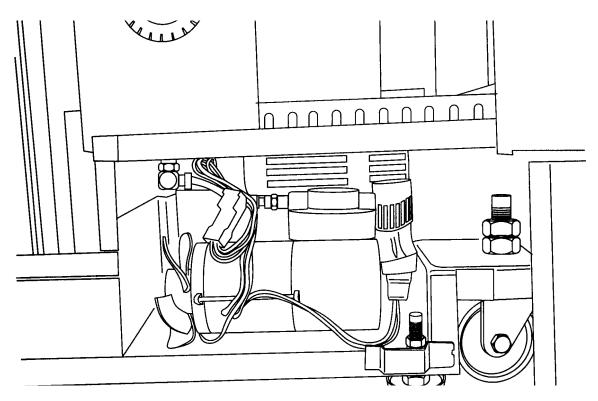


figure 1-12

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SENSOR FOC B6

SENSOR FOC is replaced with the same type of sensors used for FILM PRESENCE DETECTION.

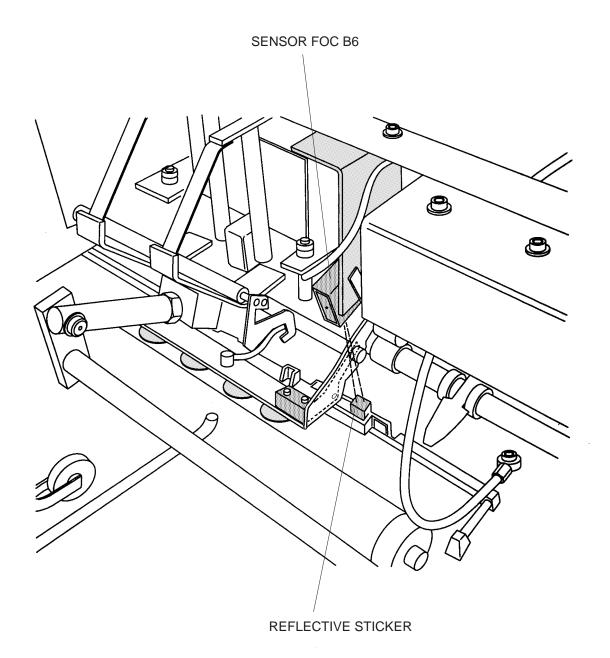


figure 1-13

TUNNEL

TUNNEL SENSOR FRONT and TUNNEL SENSOR REAR are replaced with a new type. The new SENSORS detect the reflection from the film surface.

2 GUIDES, 1 left and 1 right are added to guide the FILMS through the TUNNEL CONVEYER better into the PROCESSOR.

PRINTED CIRCUIT BOARD PCB A4 PLUS

The new PCB A4 PLUS can be used in ML700 and in ML700 Plus. If used in a ML700 PLUS Jumper E1 must be in. If used in a ML700 Jumper E1 must be out.

In the ML700 PLUS a different FRONT DOOR SOLENOID is used. This SOLENOID has a cycle time of 15%. The FRONT DOOR SOLENOID of the ML700 has a cycle time of 100%. Due to the 15% cycle time the new SOLENOID draws more current than the old one. This overloads the drivers on PCB A4. For this reason an altered PCB A4 is used for the ML700 PLUS. DO NOT USE PCB A4 FROM THE ML700 IN A ML700 PLUS. PCB A4 WILL FAIL!

PRINTED CIRCUIT BOARD PCB A7 Plus



Caution

PCB A7 Plus must not be used in a ML700

Due to the improved DOUBLE FILM DETECTION a new PCB A7 Plus is used.

PRINTED CIRCUIT BOARD PCB A9 Plus



Caution

PCB A9 Plus must not be used in a ML700

Due to the replaced SENSORS FOC / TSF and TSR a new PCB A9 Plus is used. The SENSOR REPLACEMENT and the change of PCB A9 allow the use of INFRARED FILMS.

SOFTWARE



THIS SOFTWARE CANNOT BE USED FOR THE ML700.

A new software, VERSION 5.0, is used for the ML700 PLUS.

- 1. The software is adapted to the LCD DISPLAY.
- 2. After pressing BUTTON 4 (open FRONT DOOR) the DOOR SOLENOID is energised for 3 seconds. If during these 3 seconds the FRONT DOOR does not open (maybe it is mechanically blocked), the STANDARD SCREEN is displayed.

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After Start of SERIAL UNLOAD the DOOR SOLENOID is energised for 3 seconds. If during these 3 seconds the FRONT DOOR does not open, the message "NO MAGAZINE SELECTED FOR SERIAL UNLOAD" is displayed. If BUTTON C is pressed the STANDARD SCREEN will be displayed again.

- 3. If the INCH FLAG is set to 1, 14x17 in X is displayed and not 35x43 cm X.
- **4**. The size 11x14 in V is eliminated.
- **5**. All languages are in 1 (one) EPROM.
- **6**. After unloading the CASSETTE it is checked once more with the FILM PRESENCE DETECTOR BOTTOM if there is a FILM on the bottom screen of the CASSETTE. This is done prior to loading the new FILM. If there is a FILM, the CASSETTE is transported out and the message PLEASE INSERT CASSETTE AGAIN is displayed.

REPLACEMENTS 3053-3

CHAPTER 2



DO NOT LOOSEN THE RED MARKED SCREWS OR NUTS. THESE ARE FACTORY ADJUSTMENTS ONLY.

3053-3 REPLACEMENTS

SPECIAL TOOLS

OPENER TOOL	9193396
OPENER GAUGE	9193386
TEMPLATE, CASSETTE LID C1, C2, C3	9194501
TEMPLATE, TUBESIDE SCREEN C1, C2, C3	9194511
TEMPLATE, WINDOW C1	9194521
TEMPLATE, LID SCREEN C-2	9194531
TEMPLATE, WINDOW C-3	9194541
ALLEN KEY 10mm	9197313
METRIC OPEN END WRENCH, 30mm	9901901
TORX WRENCH SET	TL 3261
VACUUM GAUGE	29010170
PRESSURE GAUGE	9186781
METRIC ALLEN SET	TL 2764
METRIC ALLEN SET BALL ENDED	
METRIC OPEN END WRENCH SET	TL 2765
FILTER, for adjusting the DOUBLE FILM SENSOR	9191223
SERVICE KEY, INTERLOCK SWITCHES	9901918
METRIC SOCKET WRENCH SET	G9901934
ESD KIT	TL3346
DENTIST MIRROR	TL 2753
TEMPLATE ML700	TL 5089
TEMPLATE ML700 PLUS	TL 5089
SUCKER GAUGE	9194841

REPLACEMENTS 3053-3

REPLACEMENTS

REPLACEMENT COMPRESSOR ASSY M9

- 1. Power down ML 700.
- **2**. Unplug ML 700.
- 3. Open left SIDE PANEL.
- 4. Take off PROTECTIVE COVER with FILTER. (No FILTER in ML700 Plus).
- **5**. Unplug COMPRESSOR M9.
- 6. Unscrew CONNECTOR with PRESSURE TUBING.
- 7. Take out MOUNTING SCREWS.
- 8. Lift front of COMPRESSOR BASE.

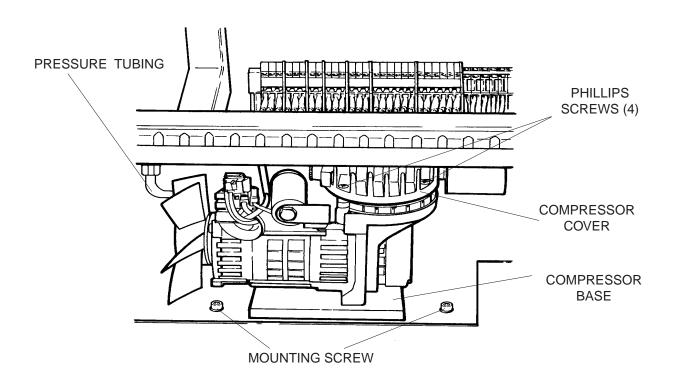


figure 2-1

3053-3 REPLACEMENTS

- 9. Pull out COMPRESSOR ASSY.
- 10. Install new COMPRESSOR.
- 11. Connect PLUG and PRESSURE TUBING.

FUNCTION TEST.

- **1**. Power up ML 700.
- 2. Actuate INTERLOCK OVERRIDE.
- 3. Open the PRESSURE RELEASE VALVE.



figure 2-2

- **4**. COMPRESSOR starts.
- 5. Close PRESSURE RELEASE VALVE.
- **6**. COMPRESSOR stops when pressure reaches +4 BAR.
- 7. Check system for leakage.

REPLACEMENT COMPRESSOR DIAPHRAGM

- 1. Remove COMPRESSOR ASSY.
- 2. Mark position of COMPRESSOR COVER.
- 3. Take out 4 PHILLIPS SCREWS. Observe the 8 SPACERS.
- 4. Replace COMPRESSOR DIAPHRAGM.

REPLACEMENTS 3053-3

- 5. Mount COMPRESSOR COVER.
- 6. Install COMPRESSOR ASSY.

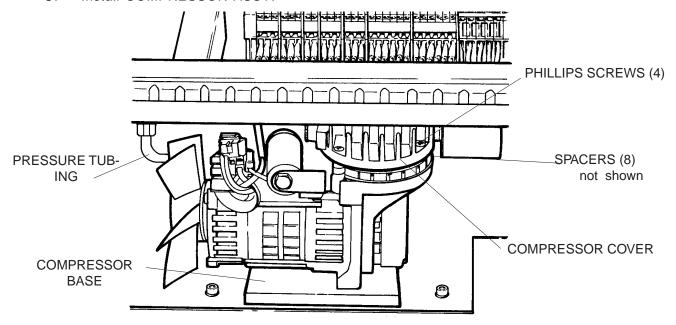


figure 2-3

FUNCTION TEST.

- 1. Power Up ML 700.
- 2. Actuate INTERLOCK OVERRIDE.
- 3. Release pressure of AIR RESERVOIR.
- **4**. COMPRESSOR starts.
- 5. COMPRESSOR stops when pressure reaches +4 bar.
- **6**. Check system for leakage.

REPLACEMENT CASSETTE TRANSPORT MOTOR M1

- 1. Power down ML 700.
- **2**. Unplug ML 700.

3053-3 REPLACEMENTS

- **3**. Unplug MOTOR M1.
- 4. Mark position of MOUNTING BRACKET on BASE.
- 5. Remove HEX SCREWS.
- 6. Take out MOUNTING BRACKET with MOTOR M1.

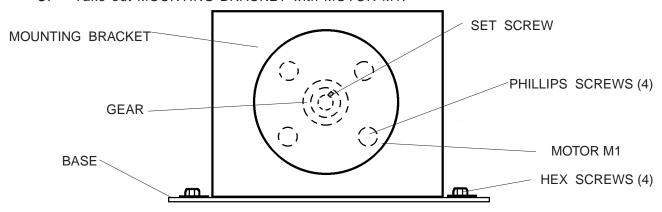


figure 2-4

- 7. Mark position of MOTOR M1 on MOUNTING BRACKET.
- **8**. Remove PHILLIPS SCREWS.
- 9. Loosen Setscrew and take of GEAR.
- **10**. Install new MOTOR M1.

FUNCTION TEST.

- 1. Power Up ML 700.
- 2. Actuate INTERLOCK OVERRIDE.
- 3. Enter SERVICE MODE FDAB Day, Day, 9, 9.
- 4. Select Option 7.1 (TEST MODE CASSETTE IN/OUT).
- **5**. Run MOTOR TEST (forward / reverse).
- 6. Leave SERVICE MODE.
- **7**. Key in 3585 to bring all MOTORS to HOME POSITION.

REPLACEMENTS 3053-3

REPLACEMENT CASSETTE OPENING MOTOR M3

- 1. Power down ML 700.
- **2**. Unplug ML 700.
- **3**. Unplug MOTOR M3.
- 4. Take off all 4 Nuts



Caution

HOLD MOTOR IT MAY FALL DOWN

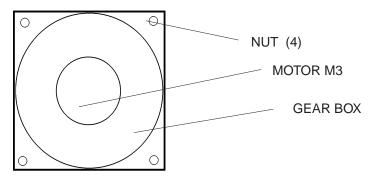


figure 2-5

- **5**. Take out MOTOR M3.
- **6**. Install new MOTOR. Make sure that the PLASTIC BUSHING is installed between MOTOR and SHAFT COUPLING.

FUNCTION TEST.

- 1. Power up ML 700.
- 2. Actuate INTERLOCK OVERRIDE.
- 3. Enter SERVICE MODE FDAB Day, Day, 9,9.
- 4. Select Option 7.3 (OPEN-CLOSE CASSETTE).
- **5**. Open/close CASSETTE (press KEY # 1/2)
- 6. Leave SERVICE MODE.
- 7. Key in 3585 to bring all MOTORS to HOME POSITION.

3053-3 REPLACEMENTS

REPLACEMENT CASSETTE CENTRING MOTOR M2

- 1. Power down ML 700.
- **2**. Unplug ML 700.
- 3. Mark position of MOUNTING BRACKET on BASE.

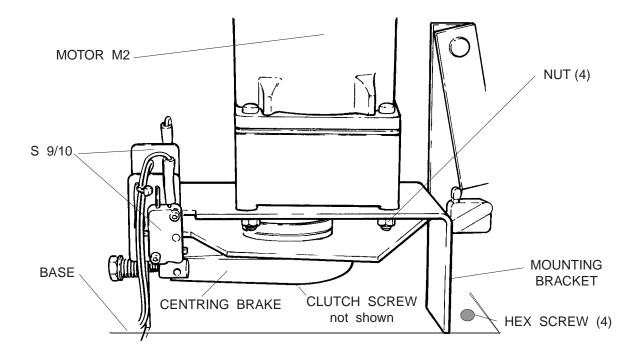


figure 2-6

- **4**. Unplug S9/10.
- **5**. Unplug MOTOR M2.
- 6. Move MOTOR to "CASSETTE CENTRING IN" position.

Note

Take care of different amount of spacers.

- **7**. Remove 4 HEX SCREWS.
- 8. Remove C-RING from CENTRING LINK.
- 9. Take out MOUNTING BRACKET and MOTOR M2.

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REPLACEMENTS 3053-3

10. Remove CENTRING BRAKE.

Note

If in the ML700 Mod 26 is installed or if a ML700 Plus is used see the following drawing for the additional BRAKE BELT TENSIONER.

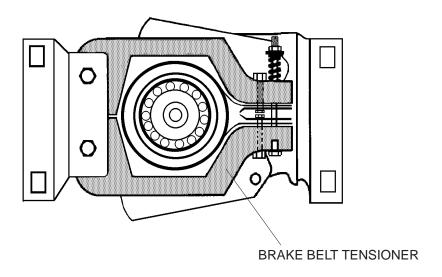


figure 2-7

- 11. Remove CLUTCH SCREW.
- **12.** Remove CAM with CLUTCH.

Note

Observe LOCATING PIN and the SPACERS.

- 13. Remove 4 Nuts.
- 14. Remove MOTOR M2 from MOUNTING BRACKET.
- 15. Install new Motor M2.

3053-3 REPLACEMENTS

- 16. Adjust the innermost and outermost position of the CENTRING BARS.
- 17. Move CENTRING BARS fully out.
- **18.** Adjust STOP SCREW 1 until side 1 of the ACTUATOR BRACKET is parallel to the MOTOR MOUNT.

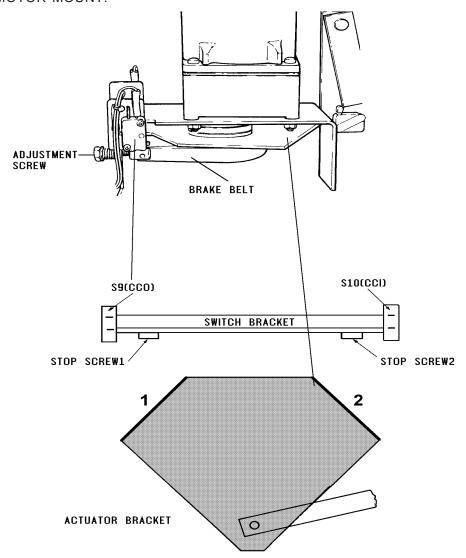


figure 2-8

- 19. Loosen the SWITCH BRACKET and adjust S9 to make it actuate 0.6 mm earlier.
- 20. Move CENTRING BARS completely in.

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REPLACEMENTS 3053-3

- **21.** Adjust STOP SCREW 2 until side 2 of the ACTUATOR BRACKET is parallel to the MOTOR MOUNT.
- 22. Adjust S10 to make it actuate 0.6 mm earlier.
- 23. Fasten SCREWS and check adjustment again.

Adjustment of the CASSETTE CENTRING BRAKE for ML700 without Mod.26

- **24.** Feed in a CASSETTE 18 x 24.
- **25.** If the CENTRING BARS do not open for approx. 2 mm on each side of the CASSETTE after CENTRING readjust the BRAKE BELT TENSION with the Adjustment SCREW.

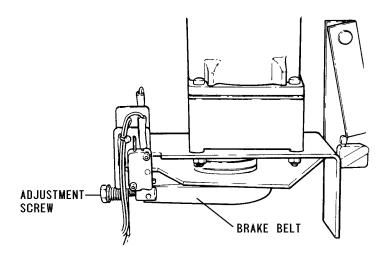


figure 2-9

- **26.** Feed in a CASSETTE 35 x 43 cm or 18 x 43 cm.
- **27.** The CENTRING BARS should now open 0.3 0.5 mm on each side after CENTRING. Readjust the BRAKE BELT Tension with the ADJUSTMENT SCREW if necessary.

3053-3 REPLACEMENTS

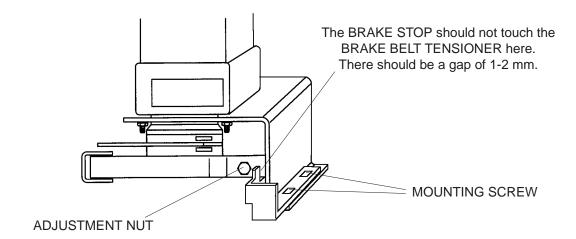
Adjustment of the CASSETTE CENTRING BRAKE for ML700 with Mod.26 and for ML700 Plus

PURPOSE:

To ensure that the CASSETTE is centred properly and that there is a gap of 1 - 2 mm between the CASSETTE 18x24 cm X and the CENTRING BARS on each side.

Note

- This gap is smaller if larger CASSETTES are used
- Check the ADJUSTMENT OF CASSETTE CENTRING STOP SWITCHES S14/15 (CCS) first.
- No FILMS are required for this adjustment
- Required Tools: WRENCH 8 mm. Use WRENCH KIT PN G9901934 or TL2765.
- 28 Check that there is a gap of 1-2 mm between BRAKE STOP and BRAKE BELT TENSIONER. If it touch loosen the 2 MOUNTING SCREWS and move the BRAKE STOP as requiresed. Tighten the SCREWS.



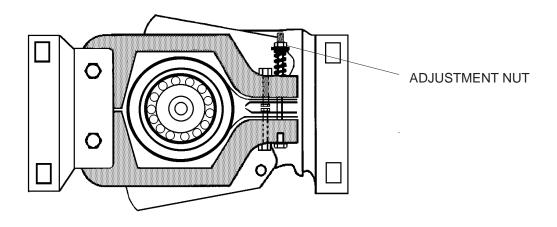


figure 2-10

- 29. Feed a 18x24 cm CASSETTE into the ML700.
- **30.** Observe that there is a gap of 1 2 mm between CASSETTE (18x24 cm) and CENTRING BAR after centring.



This gap is smaller if larger CASSETTES are used

31.

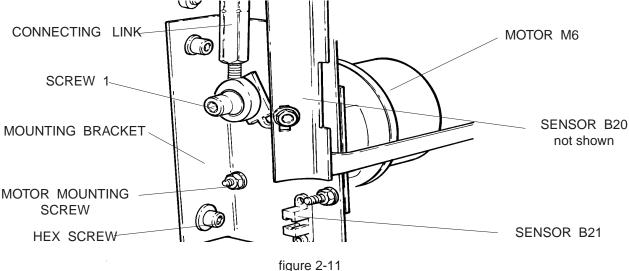
- If the gap is too small the CASSETTE becomes clamped and might not be opened.
- If the gap is too big the CASSETTE will not be held down by the movable CENTRING BAR CLAMPS and might be pulled out of position by the CASSETTE SUCKER BAR.
- If the gap is too small turn the ADJUSTMENT NUT ccw with an 8 mm WRENCH. If the gap is too big turn the ADJUSTMENT NUT cw with an 8 mm WRENCH.
- **32.** When the CASSETTE is clamped the 2 BRAKE BELT TENSIONERS make a slight movement. This movement can be minimised by repositioning the BRAKE STOP.
- **37.** Check the adjustment with various cassette sizes.
- **38.** Enable the INTERLOCK OVERRIDE SWITCH, mount the SIDE PANEL and close the TOP COVER. Insert the MAGAZINES and close the FRONT DOOR.
- 39. Run a few more cycles and ensure that the INTERLOCK SYSTEM is working.

FUNCTION TEST.

- 1. Enter SERVICE MODE FDAB, Day, Day, 9, 9.
- 2. Select option 7.2 (ALIGN CASSETTE).
- 3. CENTRING BARS in/out (press1/2)
- 4. Leave SERVICE MODE.
- 5. Key in 3585 to bring all MOTORS to HOME POSITION.

REPLACEMENT MAGAZINE OPENER MOTOR M6

- 1. Power down ML 700.
- 2. Unplug ML 700.
- 3. Take off REAR PANEL.
- 4. Open LEFT SIDE PANEL.
- **5**. Unplug MOTOR M6.
- **6**. Remove SCREW 1, take out CONNECTING LINK and discard it.



- **7**. Remove SENSORS B20/21.
- 8. Mark position of MOUNTING BRACKET.
- 9. Remove 2 HEX SCREWS.
- 10. Take out MOUNTING BRACKET with MOTOR M6.
- 11. Remove 4 MOTOR MOUNTING SCREWS.
- 12. Install new MOTOR. Use the CONNECTING LINK deliverred with the new motor. The old CONNECTING LINK may cause a short circuit on PCB A10. Check that MOTOR M6 does not touch PCB A10.
- **13**. Adjust MAGAZINE OPENER MOTOR M6.

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FUNCTION TEST

- 1. Enter SERVICE MODE FDAB, Day, Day, 9, 9.
- 2. Select option 7.6 (OPEN/CLOSE MAGAZINE).
- 3. Select a MAGAZINE and open it (press 1).
- 4. Check adjustment.
- **5**. Close MAGAZINE (press KEY # 2).
- **6**. Deenergize SOLENOID (press KEY # 6).
- 7. Leave SERVICE MODE. Key in 3585 to bring all motors to HOME POSITION.

REPLACEMENT FILM POCKET MOTOR M7

- 1. Power down ML 700.
- **2**. Unplug ML 700.
- 3. Take off REAR PANEL, open the LEFT SIDE PANEL and unplug MOTOR M7.

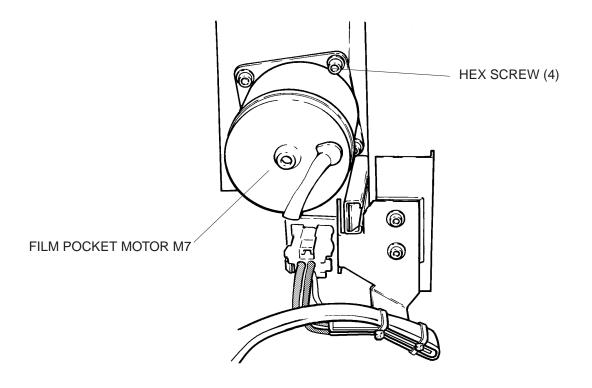


figure 2-12

- 4. Rotate MAGAZINE SUCKER BAR into TRANSPORT POSITION.
- **5**. Remove 4 HEX SCREWS.
- 6. Pull out MOTOR M7 with CLUTCH.
- **7**. Remove CLUTCH.
- **8**. Take out DOWEL PIN.
- 9. Install DOWEL PIN and CLUTCH on new MOTOR.
- 10. Install new MOTOR M7.

FUNCTION TEST

- 1. Enter SERVICE MODE FDAB, Day, Day, 9, 9.
- 2. Select Option 7.7 (MAGAZINE SUCKER BAR).

Note

Pull out MAGAZINES so that they will not be hit by the MAGAZINE SUCKERBAR.

- 3. Move MAGAZINE SUCKER BAR in and out.
- **4**. Leave SERVICE MODE.
- **5**. Key in 3585 to bring all MOTORS to HOME POSITION.

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REPLACEMENT VACUUM PUMP CASSETTE M11

- 1. Power down ML 700.
- **2**. Unplug ML 700.
- **3**. Open TOP COVER.
- 4. Open LEFT SIDE PANEL.
- 5. Unplug MOTOR M11 and SWITCH S30 (VACUUM SWITCH).
- **6**. Remove TUBING.
- 7. Remove MOUNTING SCREWS.

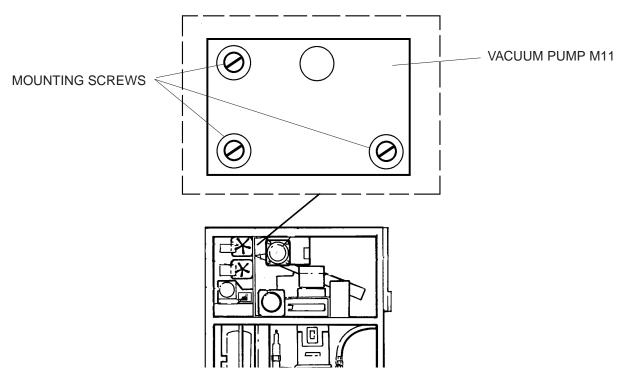


figure 2-13

- 8. Disconnect GROUND WIRE.
- **9**. Lift out VACUUM PUMP.
- 10. Install new VACUUM PUMP.

11. Connect MOTOR M11 and SWITCH S30.

FUNCTION TEST

- 1. Enter SERVICE MODE FDAB, Day, Day, 9, 9.
- 2. Select Option 7.8.2 (MOTOR VACUUM PUMPS).
- 3. Switch on VACUUM PUMP. PUMP runs for a short moment until vacuum reached the set level.
- 4. Take off VACUUM TUBING. PUMP runs.
- 5. Switch off VACUUM PUMPS (press KEY # 2).
- **6**. Connect VACUUM TUBING.
- 7. Connect the VACUUM GAUGE.

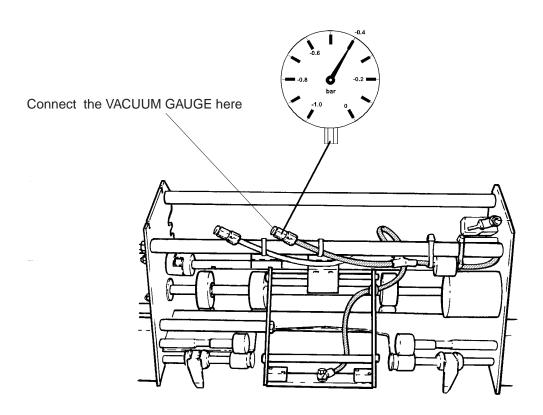


figure 2-14

- **8**. Switch on the VACUUM PUMPS (Option 7.8.2).
- **9**. Switch on CASSETTE SUCKING (Option 7.8.3).
- 10. Cover CASSETTE SUCKERS with a FILM.
- **11.** Loosen the LOCK NUT and adjust with the BRASS NUT the vacuum to -400 mBar 30 mBar

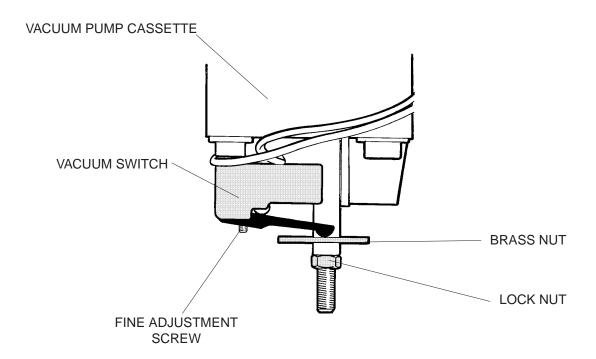


figure 2-15

- 12. Tighten the LOCK NUT.
- 13. If necessary readjust the vacuum with the FINE ADJUSTMENT SCREW.
- 14. Switch off CASSETTE SUCKING and VACUUM PUMPS.
- 15. Leave SERVICE MODE.
- **16.** Key in 3585 to bring all MOTORS to HOME POSITION.

REPLACEMENT VACUUM PUMP MAGAZINE M10

- 1. Power down ML 700.
- **2**. Unplug ML 700.
- 3. Open LEFT SIDE PANEL.
- 4. Unplug MOTOR M10 and VACUUM SWITCH S29.
- **5**. Remove TUBING.
- **6**. Remove 3 HEX SCREWS.

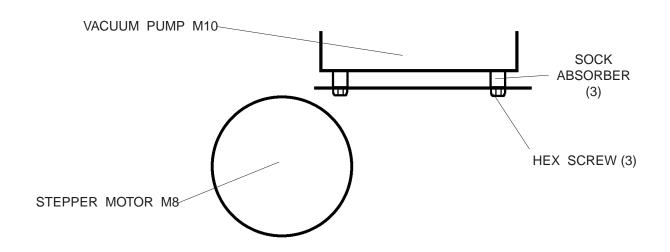


figure 2-16

- **7**. Pull out MOTOR M10.
- **8**. Take off SHOCK ABSORBERS.
- 9. Install new VACUUM PUMP

FUNCTION TEST

- 1. Go to SERVICE MODE FDAB, Day, Day, 9, 9.
- 2. Select Option 7.8.2 (MOTOR VACUUM PUMPS).
- 3. Switch on VACUUM PUMPS on (press KEY # 1). Pump runs for a short moment.

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- 4. Take off VACUUM TUBING. PUMP runs.
- 5. Switch off VACUUM PUMPS off (press KEY # 2).
- 6. Connect VACUUM TUBING.
- 7. Connect the VACUUM GAUGE

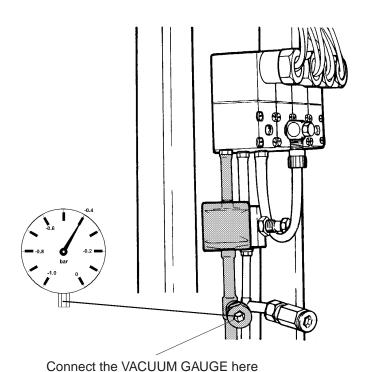


figure 2-17

- **8**. Switch on the VACUUM PUMPS (Option 7.8.2).
- **9**. Switch on MAGAZINE SUCKING (Option 7.8.4).
- 10. Cover MAGAZINE SUCKERS with a FILM.
- **11.** Loosen the LOCK NUT and adjust with the BRASS NUT the vacuum to -400 mBar 30 mBar. See the drawing on the next page.
- 12. Tighten the LOCK NUT.

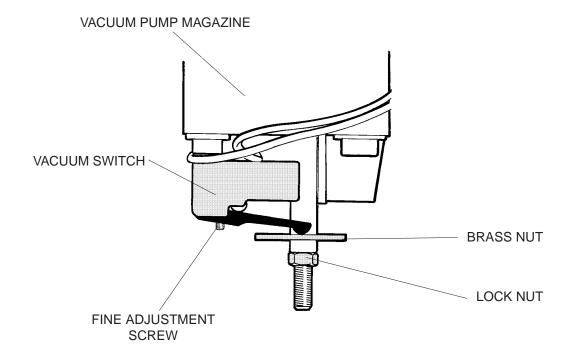


figure 2-18

- 13. If necessary readjust the vacuum with the FINE ADJUSTMENT SCREW.
- 14. Switch off CASSETTE SUCKING and VACUUM PUMPS.
- **15.** Leave SERVICE MODE.
- 16. Key in 3585 to bring all MOTORS to HOME POSITION.

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REPLACEMENT STEPPER MOTOR M8

- 1. Power down ML 700.
- **2**. Unplug ML 700.
- 3. Take off TOP COVER and REAR PANEL.
- 4. Open LEFT SIDE DOOR.
- **5**. Unplug MOTOR M8.
- 6. Loosen SPROCKET SETSCREWS.

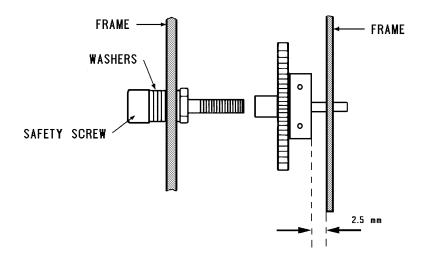


figure 2-19

- 7. Slide SPROCKET onto SAFETY SCREW.
- 8. Remove 4 NUTS.

Note

MAKE SURE THAT THE SPROCKET STAYS ON THE SAFETY SCREW.

9. Pull out MOTOR M8.



Caution

DO NOT OVER TIGHTEN THE NUTS. THE BLUE SHOCK ABSORBER WILL LOSE ITS FUNCTION.

10. Install new MOTOR M8.

FUNCTION TEST

- 1. Go to SERVICE MODE FDAB, Day, Day, 9, 9.
- 2. Select OPTION CHANGE PARAMETER.
- 3. Select OPTION NEW (press KEY # 2).
- 4. Leave SERVICE MODE.
- 5. Key in 3585 to bring all MOTORS to HOME POSITION.

REPLACEMENT CASSETTE UNLOADING MOTOR M4

- 1. Power down ML 700.
- **2**. Unplug ML 700.
- 3. Take off TOP COVER.
- 4. Take off LEFT SIDE DOOR.
- **5**. Unplug MOTOR M4.
- 6. Remove VACUUM PUMP CASSETTE M11 (see Removal Procedure).
- 7. Move CASSETTE OPENER to Open.
- 8. Loosen CLUTCH SETSCREWS (2) on DRIVE SIDE.
- **9**. Mark position of MOTOR M4 and STOPS on FRAME.

10. Remove 4 HEX SCREWS.

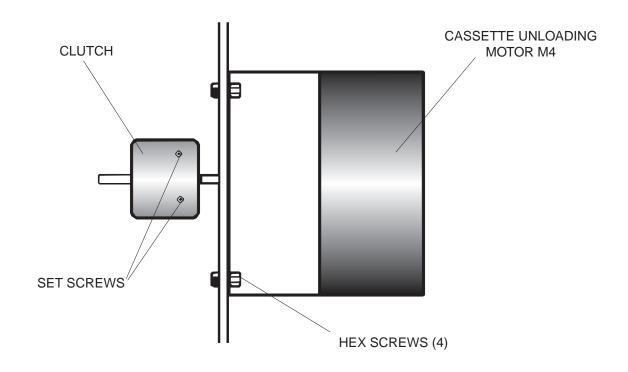


figure 2-20

- **11**. Pull out MOTOR M4.
- 12. Install new MOTOR M4.

FUNCTION TEST

- 1. Go to SERVICE MODE FDAB, Day, Day, 9, 9.
- 2. Open EXIT DOOR by hand and select Option 7.4 (CASSETTE SUCKER BAR).
- 3. Move CASSETTE SUCKER BAR in and out.
- 4. Leave SERVICE MODE.
- **5**. Key in 3585 to bring all MOTORS to HOME POSITION.

REPLACEMENT FILM TRANSPORT MOTOR M5

- 1. Power down ML 700.
- **2**. Unplug ML 700.
- **3**. Open TOP COVER.
- **4**. Open RIGHT SIDE DOOR.
- **5**. Unplug MOTOR M5.
- **6**. Cut WIRE WRAP at MOTOR.

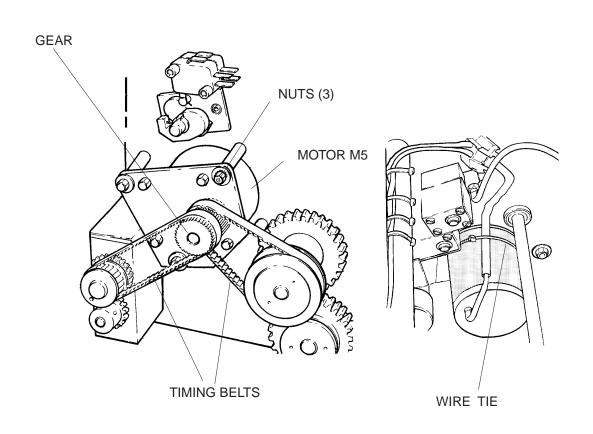


figure 2-21

- **7**. Take off 3 SCREWS.
- 8. Take off both TIMING BELTS and GEAR.

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- 9. Pull out MOTOR M5 to the right.
- 10. Install new MOTOR M5.

11. Fasten CABLE with a new WIRE WRAP (SAFETY REGULATION!). See MOD. 29.

FUNCTION TEST

- 1. Go to SERVICE MODE FDAB, Day, Day, 9, 9.
- 2. Select Option 7.5 (FILM -> PROCESSOR).
- 3. Switch MOTOR M5 on and off.
- 4. Leave SERVICE MODE, and key in 3585 to bring all MOTORS to HOME POSITION.

REPLACEMENT FILM POCKET ASSY

- 1 Power down ML 700.
- 2. Unplug ML 700.
- **3**. Take off REAR PANEL.
- 4. Take off LEFT SIDE DOOR.
- **5**. Unplug PCB A7.

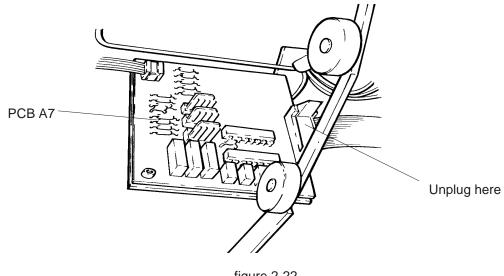


figure 2-22

- 6. Unplug FILM POCKET MOTOR M7 (see fig 15).
- 7. Take off CABLE from MOUNTING BRACKET.

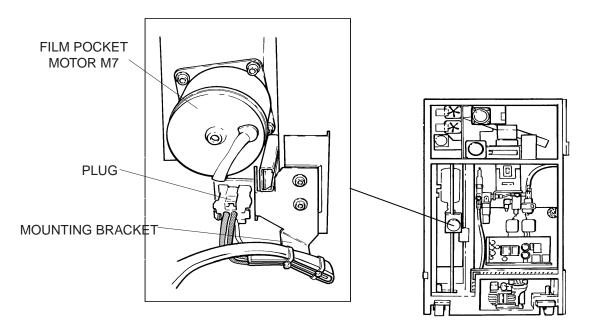


figure 2-23

- **8**. Move FILM POCKET to MAGAZINE LEVEL 4.
- **9**. Measure distance between: **A** END of SHAFT to MAGAZINE and **B** BEGINNING of SHAFT to MAGAZINE.

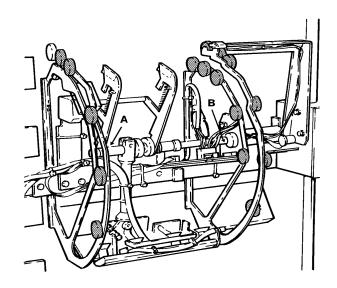


figure 2-24

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10. Loosen ALLEN SCREW.

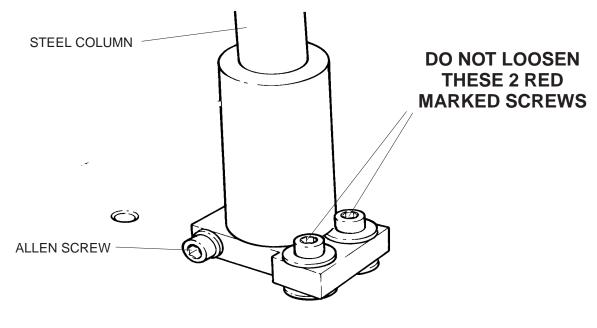


figure 2-25

11. Rotate MAGAZINE SUCKER BAR out until It is approx. in TRANSPORT POSITION 1.



Caution

WITHOUT SECURING THE CHAIN THE COUNTERWEIGHT MAY FALL DOWN.

12. Secure CHAIN with a WIRE TIE.



Caution

HOLD FILM POCKET, OTHERWISE IT MAY FALL DOWN.

13. Take out CHAIN LINK. See the top drawing on the next page.

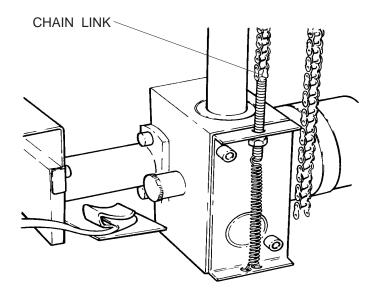


figure 2-26

- **14**. Carefully lower the FILM POCKET to the bottom.
- 15. Take out 2 ALLEN SCREWS.

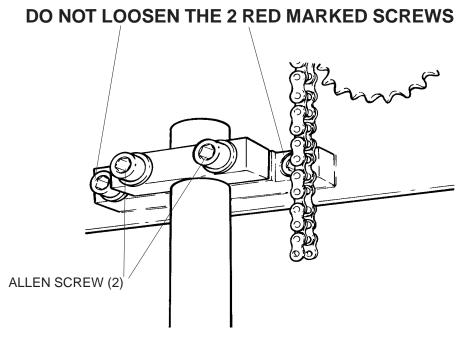


figure 2-27

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Caution

DO NOT BREAK PHOTO SENSORS. BE CAREFUL WITH SENSORS REFERENCE POSITION B15(RP), HOME POSITION B19(HP) on PCB A10 and LOWER LIMIT B18(LL) on PCB A10.

- 16. Take out FILM POCKET with STEEL COLUMN.
- 17. Install new FILM POCKET ASSY.
- 18. Make FILM POCKET SHAFT parallel to MAGAZINE #4. Use values from step 9.
- 19. Check the FILM POCKET ADJUSTMENTS.

FUNCTION TEST

- 1. Enter SERVICE MODE FDAB, Day, Day, 9, 9.
- 2. Select Option "CHANGE PARAMETER".
- 3. Start Option "NEW" (press KEY # 2).
- 4. Leave SERVICE MODE.
- **5**. Key in 3585 to bring all MOTORS to HOME POSITION.
- 6. Load CASSETTE from all MAGAZINE LEVELS.

REPLACEMENT OF FILM POCKET TORSION SPRINGS for ML700 up to SN 2022 (50 Hz) and 5931 (60Hz) if Modification 19 is not installed.

- 1. Power down ML700.
- **2**. Unplug ML700.
- 3. Separate ML700 from PROCESSOR.
- **4**. Take off REAR PANEL from ML700.
- 5. Remove LEFT HAND FILM HOLDER of FILM POCKET.

- 6. Remove MOUNTING BRACKET of MAGAZINE EMPTY SENSOR (ME).
- 7. Loosen the LOCKNUT and the MAGAZINE SUCKERBAR ARM MOUNTING SCREW.
- **8**. Slide the following parts out to the left:
- FILM REJECTER BRACKET
- MAGAZINE SUCKERBAR ARM
- CAMS with TORSION SPRINGS.

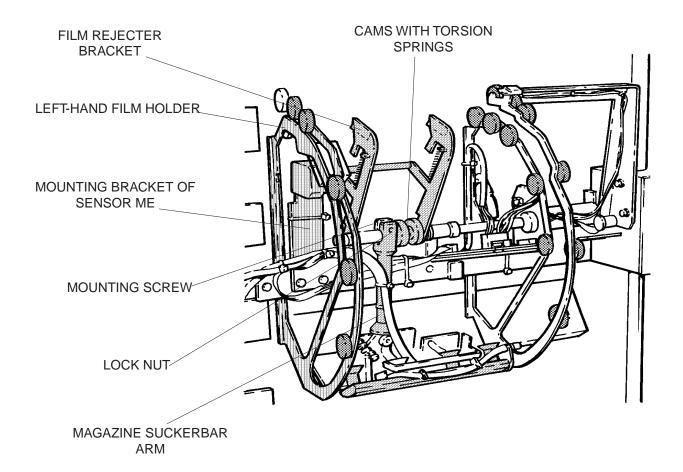


figure 2-28

Note

Make sure that the DOWEL PIN of the LEFT HAND CAM is engaged to the MAGAZINE SUCKER BAR ARM.

- 9. Install new TORSION SPRINGS.
- 10. Do not tighten the MOUNTING SCREW of the MAGAZINE SUCKER BAR ARM.

12/1998 2-32 KODAK AG, Stuttgart

- 11 Mount the MAGAZINE EMPTY SENSOR BRACKET.
- 12. Mount the LEFT HAND FILM HOLDER.
- 13. Insert an empty MAGAZINE without a COVER into MAGAZINE POSITION 4.
- **14**. Power up ML700
- 15. Enter SERVICE MODE FDAB DAY, DAY, 9,9
- **16**. Select OPTION 7.8.1 (FILM POCKET)
- **17**. Transport FILM POCKET to MAGAZINE LEVEL 4.
- **18**. Select OPTION 7.7 (MAGAZINE SUCKER BAR)
- 19. Press KEY 1 until FILM POCKET MOTOR M7 stops. The FILM POCKET DRIVE SHAFT with its TIMING DISKS is now in MAGAZINE SUCKER BAR IN position.
- **20**. Carefully rotate the MAGAZINE SUCKER BAR ARM upwards until it is in a vertical position. Then tighten the MAGAZINE SUCKER BAR ARM MOUNTING SCREW.
- 21. Check the FILM POCKET ADJUSTMENTS.
- **22**. Leave the SERVICE MODE
- 23. Key in 3585 to bring all MOTORS into HOME POSITION.
- **24**. MOUNT the COVER onto the MAGAZINE.

REPLACEMENT OF FILM POCKET CLUTCH SPRING for ML700 Plus and for ML700 with Modification 19 installed.

- 1. Power down ML700.
- **2**. Unplug ML700.
- 3. Separate ML700 from PROCESSOR.
- 4. Take off REAR PANEL from ML700.

5. Loosen the COLLAR SET SCREW.

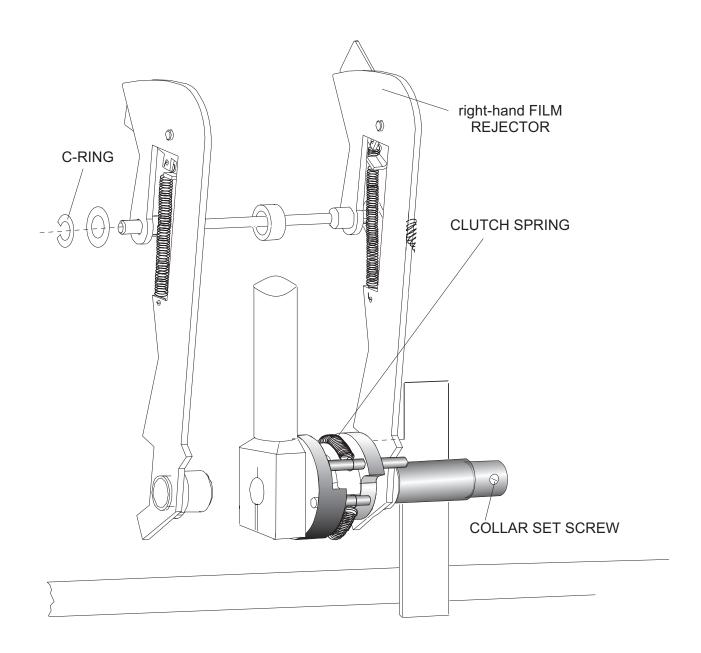


figure 2-29

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6. Slide the right-hand FILM REJECTER to the right. This allows to take out the CLUTCH SPRING. If the REJECTER cannot be slid enough to the right to take out the SPRING, take off the C-RING and WASHER at the left-hand FILM REJECTER.

- Clean the surface of the CLUTCH RING and lubricate it with a small amount of PLASTILUBE with MOLY TL2201.
- 8. Install the new CLUTCH SPRING.
- **9**. Move the COLLAR fully to the left and tighten the SET SCREW. If you took off the C-RING and WASHER in step 6, mount it now.
- 10. Mount all PANELS.

FUNCTION TEST

1. Run several cycles with different FILM sizes.

REPLACEMENT MAGAZINE SUCKERS

- 1. Switch off the ML700.
- **2**. Take off the REAR PANEL.

Note

Do not bend the FILM POCKET MECHANISM

- 3. Carefully take off all 4 MAGAZINE SUCKERS and discard them.
- 4. Mount the 4 new SUCKERS.
- **5**. Use the SUCKER GAUGE to ensure that the inner surface of all 4 SUCKERS have the same distance from the SUCKER BAR.

The SUCKER GAUGE gives the distance between the inner surface of the SUCKER and the SUCKER BAR. Do not measure from the SUCKER LIP to the SUCKER BAR.

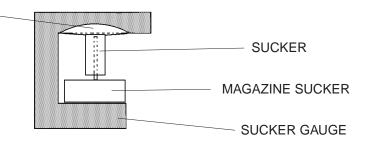


figure 2-30

- **6**. Switch on the ML700 to check the adjustment.
- 7. Test the position of the BLOW PIPE SLITS in relation to the FILM POCKET SUCKERS. Enter the SERVICE MODE, tilt the MAGAZINE SUCKER BAR, switch on MAGAZINE SUCKING, switch on the VACUUM PUMPS.

8. Place the BLOWPIPE POSITIONER GAUGE TL 4957 onto the FILM POCKET SUCKERS.

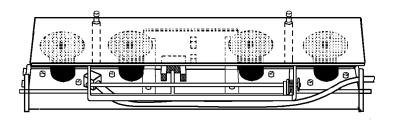


figure 2-31

9. Check that the SLIT of the BLOWPIPES is just above the BLOWPIPE POSITIONER.

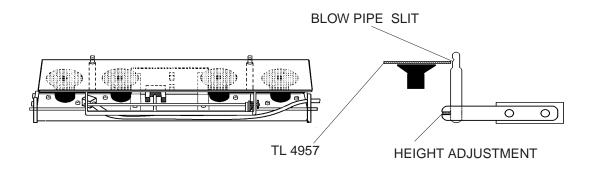


figure 2-32

Note

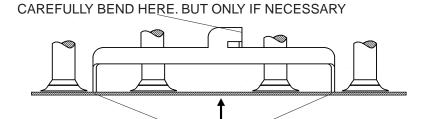
The position of the slit in the BLOWPIPES is important to separate the films in the MAGAZINES.

10. If the position of the SLIT is not correct, loosen the HEIGHT ADJUSTMENT SCREWS of the BLOWPIPES and move the BLOWPIPES up or down as required. Then fasten the SCREWS.

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11. Remove the BLOW PIPE POSITIONER TOOL from the SUCKERS. The TOOL can only be taken off, after the VACUUM PUMPS are switched off and after MAGAZINE SUCKING is disabled.

- 12. Start the SENSOR TEST
- **13.** Carefully press down the tool onto the SUCKERS. After 0.2 0.5 mm, SENSOR B9 MAGAZINE FILM PIN should be actuated.
- 14. If the SENSOR is not actuated, carefully bend the ACTUATOR BRACKET.



Both ACTUATORS must touch the TOOL at the same time

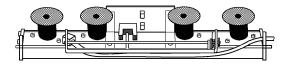


figure 2-33

15. Exit the SERVICE MODE

FUNCTION TEST

- 1. Mount all PANELS.
- 2. Run a few cycles to ensure proper operation.

REPLACEMENT MAGAZINE SUCKER BAR

- 1. Switch off the ML700.
- 2. Remove the REAR PANEL.
- 3. Disconnect the WHITNEY MECHANISM.

4. Disconnect the VACUUM HOSE from the MAGAZINE SUCKER BAR.

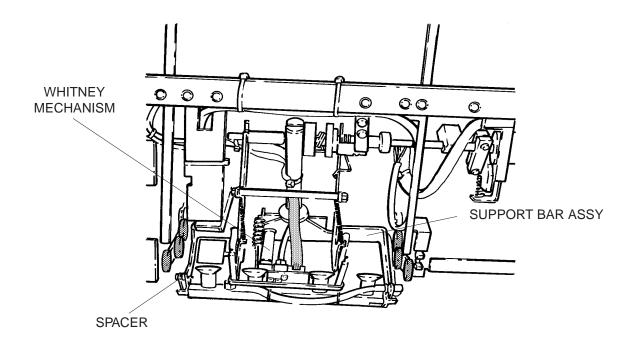


figure 2-34



Do not loose the SPACER.

Carefully bend the SUPPORT BAR ASSY outwards and take out the MAGAZINE SUCKER BAR.



Caution

When installing the new MAGAZINE SUCKER BAR check that the SUPPORT BAR ASSY is not opened to much, otherwise the SUCKER BAR may fall out of its mount.

6. Install the new MAGAZINE SUCKER BAR, connect the VACUUM HOSE and the WHITNEY MECHANISM.

FUNCTION TEST

1. Enter the SERVICE MODE. FDAB, Day, Day, 9,9

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- 2. Select Option 7.8.2 (VACUUM PUMPS).
- 3. Switch the VACUUM PUMP on. The PUMP should run for a short moment, until the VACUUM is built up.
- 4. Select Option 7.8.4 (MAGAZINE SUCKING).
- 5. Switch MAGAZINE SUCKING on. The VACUUM PUMP is now running.
- 6. Cover the MAGAZINE SUCKERS with a FILM. The VACUUM PUMP should stop.
- **7**. If the VACUUM PUMP does not stop, check for a leakage in the MAGAZINE VACUUM SYSTEM.
- 8. Switch MAGAZINE SUCKING off.
- **9**. Take out the FILM.
- 10. Switch MAGAZINE TILTING On / Off (press 1 / 2).
- **11.** Leave the SERVICE MODE and key in 3585 to bring all MOTORS to HOME POSITION.

REPLACEMENT TRANSPORT BELT

- 1. Power down ML 700.
- **2**. Unplug ML 700.
- 3. Open TOP COVER.
- 4. Remove RIGHT SIDE DOOR.
- **5**. Unplug CONNECTORS X2, X4, X8, X14 on PCB A9.

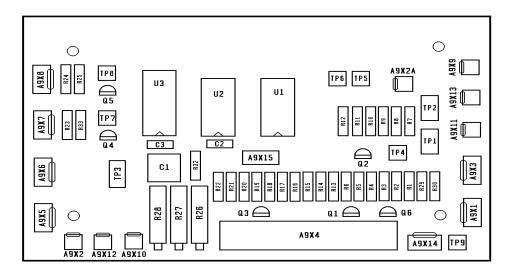


figure 2-35

6. Mark position of CASSETTE CENTRING BRACKET and of PRESSURE ROLLER BRACKET.

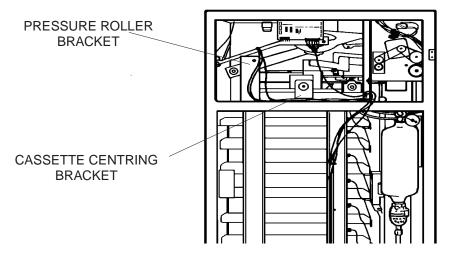


figure 2-36

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- 7. Take out CASSETTE CENTRING BRACKET.
- 8. Take out PRESSURE ROLLER BRACKET.
- 9. Remove the right-hand CENTRING BAR from the LINKAGE.



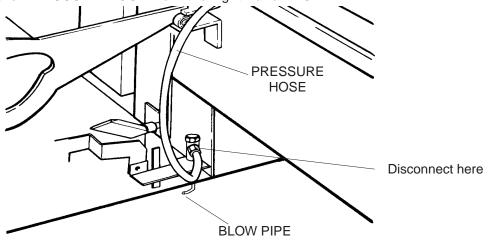


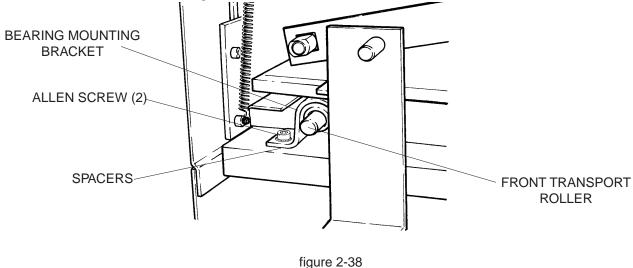
figure 2-37

11. Take out right-hand CENTRING BAR.

Note

OBSERVE THE AMOUNT OF SPACERS.

12. Take out left and right BEARING MOUNTING BRACKET.



13. Take out BEARING MOUNTING BLOCK.

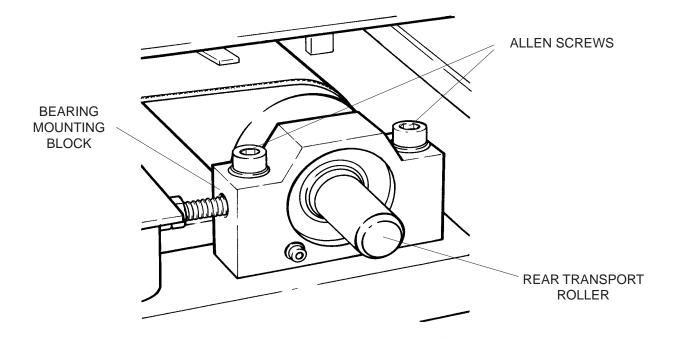


figure 2-39

14. Loosen SET SCREW of CLUTCH ASSY.

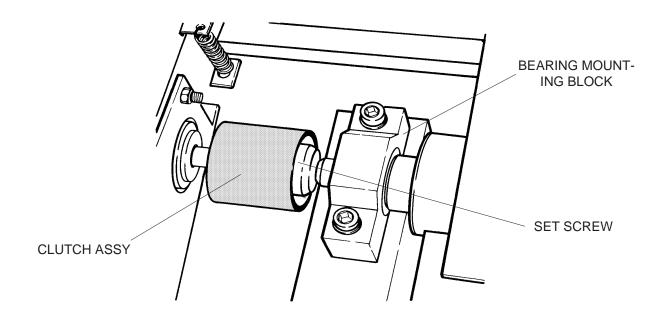


figure 2-40

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15. Remove the 2 right-hand ALLEN SCREWS from BELT SUPPORT.

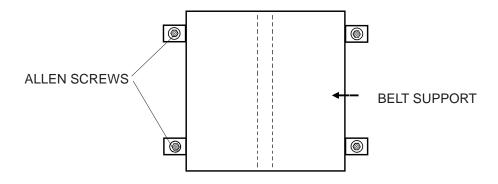


figure 2-41

- 16. Take out FRONT and REAR TRANSPORT ROLLERS.
- 17. Pull out TRANSPORT BELT.



Do not scratch the silicon surface of the new TRANSPORT BELT.

- 18. Install new TRANSPORT BELT.
- **19.** Install all parts removed in steps 5 to 16.
- **20**. Do the CASSETTE SUPPORT ADJUSTMENT. See Chapter 4.

FUNCTION TEST

- 1. Enter SERVICE MODE FDAB, Day, Day, 9.9.
- 2. Select Option 7.1 (FEED CASSETTE).
- 3. Move BELT forward and backward.
- 4. Leave SERVICE MODE.
- **5**. Key in 3585 to bring all MOTORS to HOME POSITION.

REPLACEMENT CASSETTE SUCKERS

- 1. Power down ML 700.
- **2**. Unplug ML 700.
- **3**. Open TOP COVER.
- **4**. Open EXIT DOOR.
- 5. Disconnect VACUUM HOSE. Loosen HEX NUT. Take off ALLEN SCREW.

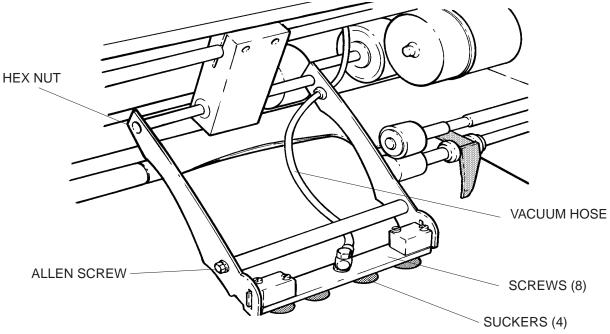


figure 2-42

- 6. Take out CASSETTE SUCKER BAR.
- 7. Take out 8 SCREWS. See figure 29. Do not damage the THREADS in the SUCKER BAR.
- 8. Take out SUCKERS with MOUNTING PLATE.
- 9. Replace SUCKERS.
- 10. Mount the CASSETTE SUCKER BAR.
- 11. Connect the VACUUM HOSE.

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FUNCTION TEST

- 1. Enter SERVICE MODE FDAB, Day, Day, 9.9.
- 2. Select Option 7.8.2 (VACUUM PUMPS).
- 3. Switch on VACUUM PUMP. The CASSETTE VACUUM PUMP should run for a short moment.
- 4. Select Option 7.8.3 (CASSETTE SUCKING).
- 5. Switch on CASSETTE SUCKING. The CASSETTE VACUUM PUMP is now running.
- 6. Cover CASSETTE SUCKERS with a FILM. The VACUUM PUMP should stop.
- 7. If the CASSETTE VACUUM PUMP does not stop check for a leakage.
- 8. Switch of CASSETTE SUCKING and take out FILM.
- **9**. Leave SERVICE MODE.
- 10. Key in 3585 to bring all MOTORS to HOME POSITION.

REPLACEMENT TRANSPORT SHAFT ASSY

- 1. Power down ML 700.
- **2**. Unplug ML 700.
- **3**. To separate ML 700 from TUNNEL do the following:
- Take of DRIVE BELT
- Unplug TUNNEL CONNECTOR
- Open QUICK DISCONNECTOR
- Release TUNNEL SAFETY LOCK
- Pull ML 700 away from TUNNEL
- 4. Open RIGHT and LEFT SIDE DOOR.
- **5**. Take off complete TOP COVER.
- 6. Remove both VACUUM PUMPS.

7. Take off TIMING BELTS on both sides.

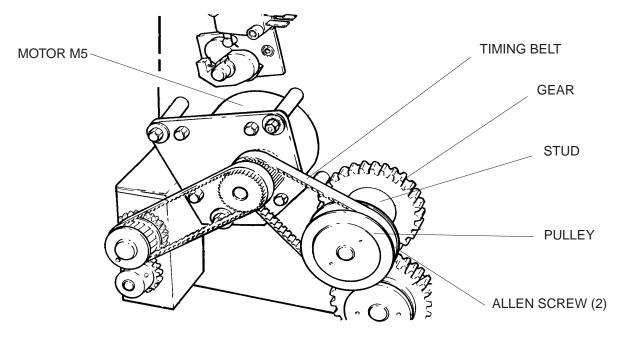


figure 2-43

- 8. Loosen the 2 ALLEN SCREWS of the PULLEY.
- **9**. Move SHAFT to the right.
- 10. Take PULLEY, STUD, GEAR and BEARING from the SHAFT.

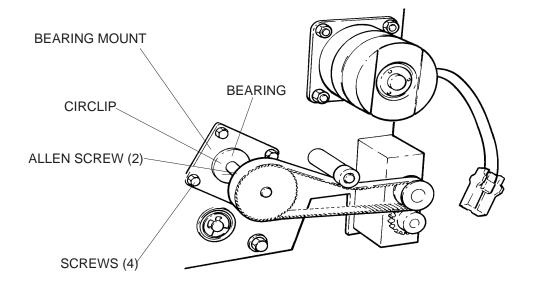


figure 2-44

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11. Loosen the 2 ALLEN SCREWS of the PULLEY and take off the PULLEY. Take off the CIRCLIP.

- 12. Take off the BEARING.
- 13. Take out the 4 SCREWS of the BEARING MOUNT.
- 14. Take out the Bearing Mount.
- 15. Move TRANSPORT SHAFT ASSY to the right, so that the left end comes free.
- 16. Take out the TRANSPORT SHAFT ASSY.
- 17. Install the new TRANSPORT SHAFT ASSY.
- 18. Install both VACUUM PUMPS.

Function Test

- 1. Run a complete CYCLE with the largest FILM available.
- 2. Check processed FILM for artefacts

REPLACEMENT TRANSFORMER T1

- 1. Power down and unplug the ML 700
- 2. Open FRONT DOOR
- 3. Unlock DRAWER and pull it out completely
- **4**. Take HEX SCREW and TORX SCREW out and remove the TRANSFORMER COVER. See the top drawing on the next page.
- **5**. Make a note on how the TRANSFORMER is wired.
- **6**. Disconnect TRANSFORMER.
- 7. Take out the 4 HEX TRANSFORMER MOUNTING SCREWS.
- **8**. Pull out the TRANSFORMER to the front.

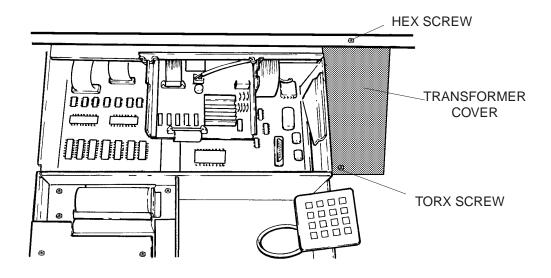


figure 2-45

- 9. Install new TRANSFORMER.
- 10. Check the LINE VOLTAGE SETTING for the TRANSFORMER.

REPLACEMENT OF PRINTER

- 1. Power down ML 700.
- 2. Unplug ML 700.
- 3. Pull out DRAWER.

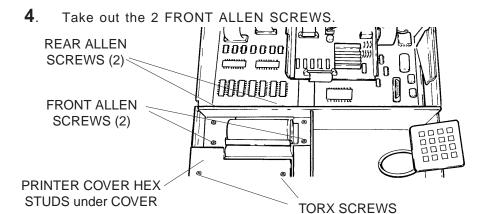


figure 2-46

REPLACEMENTS 3053-3

- 5. Take out the 2 REAR ALLEN SCREWS...
- 6. Take out the 2 TORX SCREWS.
- 7. Take off the PRINTER COVER.
- **8**. Take out the 2 HEX STUDS.
- **9**. Take out the PRINTER.
- **10.** Install the new PRINTER.

Function Test



The new PRINTER has bigger fonts than the early PRINTERS.

1. Print Status Report.

3053-3 REPLACEMENTS

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REPAIR KITS SM 3053-3

CHAPTER 3

INFILL PANEL REPAIR KIT 9289936

The REPAIR KIT 9289936 is used to replace the MOUNTING BOLTS of the following INFILL PANELS:

ML700

INFILL PANEL right	9189907
INFILL PANEL left	9189947

ML700 Plus

INFILL PANEL r	ight	9289906
INFILL PANEL I	eft	9289946

- 1. Take off the broken MOUNTING BOLT.
- 2. Insert the REPAIR KIT SCREW from the outside.
- 3. Fix the REPAIR KIT SCREW from the inside with the REPAIR KIT NUT.

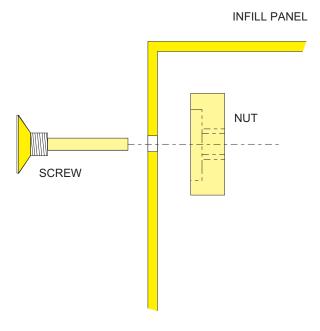


figure 3-1

SM 3053-3 REPAIR KITS

MAGAZINE DOOR SPRING REPAIR KIT 9280706



This REPAIR KIT is for ML700 Plus only.

Introduction

If the MAGAZINE DOOR does not pop open, the MAGAZINE DOOR SPRING has to be replaced. If this SPRING is only retentioned, it will become weak again.

PACKING LIST

REPAIR KIT MAGAZINE DOOR SPRING	9280706	
INSTRUCTIONS		1
MAGAZINE DOOR SPRING	9280701	1
SELF TAPPING SCREW	8243354	4
DRILL BIT 3.5 mm		1

SPECIAL TOOLS



The special tools are not part of the REPAIR KIT!

- POWER DRILL
- TORX L-WRENCH T20 (TL-3265)

INSTALLATION



For details see the drawing on the next page

- 1. Open the MAGAZINE DOOR.
- 2. Switch off the ML700 PLUS.

REPAIR KITS SM 3053-3

Note

This SPRING is riveted to the FRAME. Remove the RIVETS with a CHISEL and a HAMMER. It is okay if the RIVETS fall into the hollow FRAME.

- 3. Take out the existing MAGAZINE DOOR SPRING.
- 4. Enlarge the rivet holes in the frame. Use the DRILL BIT from the REPAIR KIT.
- **5**. Mount the SPRING from the REPAIR KIT with 2 of the SELF TAPPING SCREWS from the KIT.

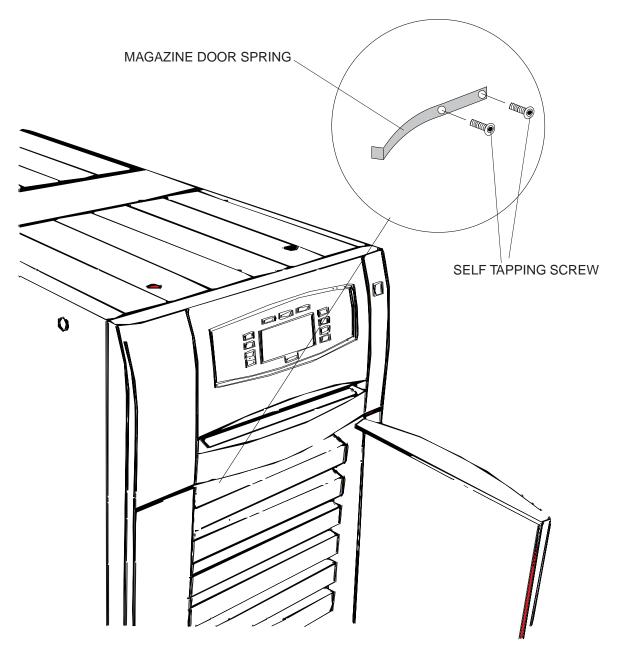


figure 3-2

SM 3053-3 REPAIR KITS

PRINTED CIRCUIT BOARD A0 PN 9189070



Important

When you install a new PCB A0 set the JUMPER A0X11 as shown below.

ML700
 PCB A15 (Piggy back PCB for U35) which was part of Mod 24 is no longer needed. Insert the LANGUAGE EPROM U35 straight into the SOCKET U35.

ML700 Plus PCB A15 (Piggy back PCB for U35) which was used up to SN 3372 (50 Hz) and SN 7273 (60 Hz) is no longer needed. Insert the LANGUAGE EPROM U35 straight into the SOCKET U35.

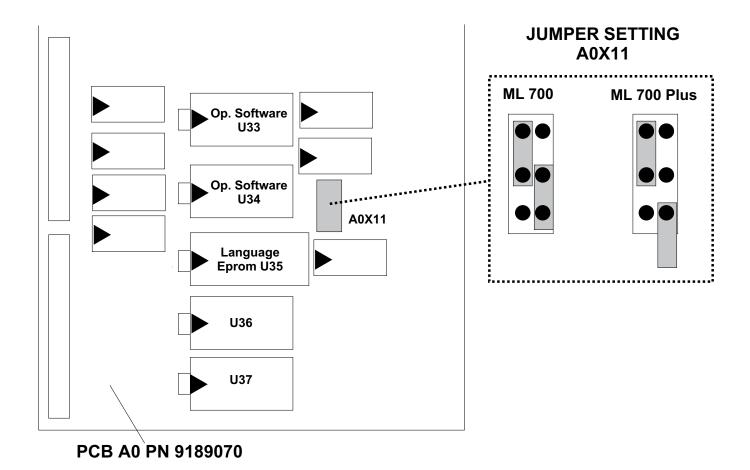


figure 3-3

REPAIR KITS SM 3053-3

VACUUM PUMP REPAIR KIT FOR ML700 / ML700 Plus PN 9285706

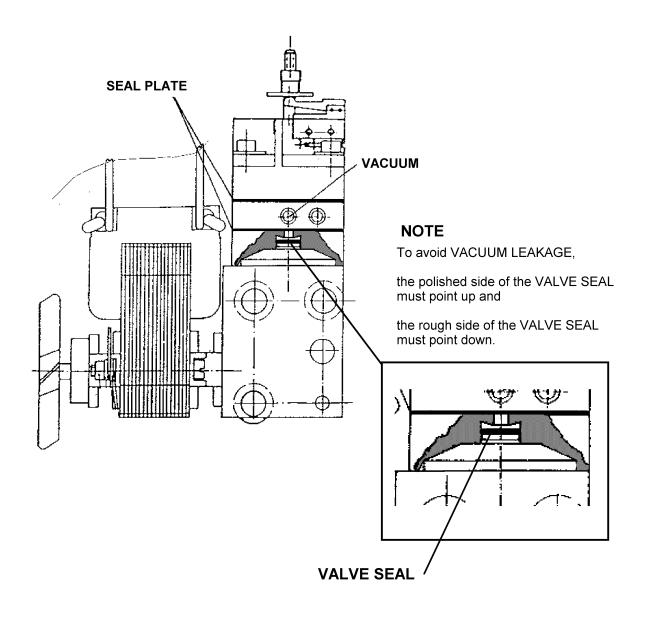


figure 3-4

SM 3053-3 REPAIR KITS

TUNNEL SENSOR TSF / TSR REPAIR KIT PN 9194426

Note

This REPAIR KIT is for the ML700 only!

The TUNNEL SENSOR 9188606 TSF / TSR is no longer available. It is replaced with this REPAIR KIT. This kit cannot be used in a ML700 PLUS!

In the original version the RECEIVER part was mounted underneath the film path and the TRANSMITTER part was mounted above the film path. The new RECEIVER has 2 TEST POINTS (red and black) to ease the adjustment. To get access to them the RECEIVER PCB has now to be installed above the film path and the TRANSMITTER PCB below it.



The PCBs for TUNNEL SENSOR FRONT and TUNNEL SENSOR REAR are installed in the same manner.

1. Switch off the ML700.



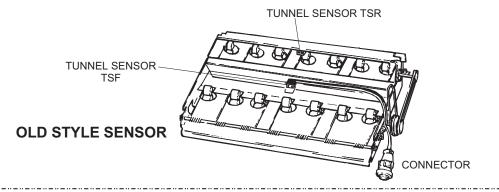
Caution

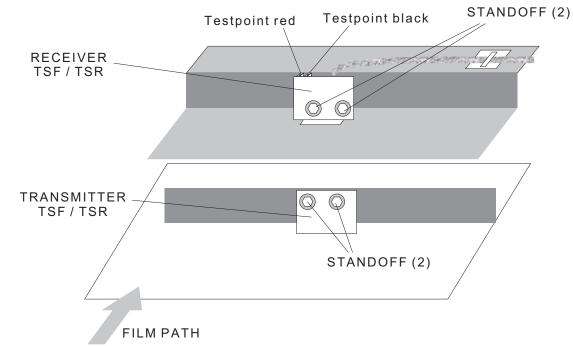
Do not brake the DRIVE BELT.

- 2. Take out the TUNNEL CONVEYOR.
- 3. Take out the defective SENSOR. (always replace RECEIVER and TRANSMITTER).
- 4. Take out the SENSOR WIRES from the big black CONNECTOR.
- **5** Mount the new SENSOR PCBs. See the drawing on the next page.
- **6**. Plug the SENSOR WIRES into the big black CONNECTOR. See the table on the next page.
- Insert the TUNNEL CONVEYOR into the TUNNEL and plug in the round CONNECTOR.
- **8**. Switch on the ML700.
- **9**. Connect the DVM to the RECEIVER TEST POINTS (red and black).
- **10.** Change the position of the RECEIVER PCB until the voltage is below 500 mV.
- 11. Interrupt the light path with a fresh film. The voltage must now be higher than 1.5 V.
- **12.** It might be necessary to change the position of the TRANSMITTER PCB if the correct voltages cannot be reached.

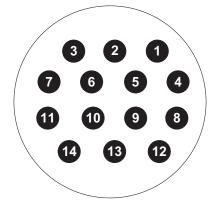
REPAIR KITS SM 3053-3

13. Ensure that the SENSOR WIRES are fixed with WIRE TIES.





_	ROUND (shield)	SIGNAL
TSF RECEIVER	1	4
TSF TRANSMITTER	6	7
TSR RECEIVER	5	8
TSR TRANSMITTER	2	3



TUNNEL CONNECTOR

figure 3-5

SM 3053-3 REPAIR KITS

FILM OUT OF CASSETTE SENSOR FOC REPAIR KIT 9194416 (Intermediate version)

Note

This REPAIR KIT is for the ML700 only!

The FILM OUT OF CASSETTE SENSOR FOC PN 9181106 is no longer available. It is replaced with this REPAIR KIT. This kit cannot be used in a ML700 Plus.

The new RECEIVER PCB has 2 TEST POINTS (red and black) to ease the adjustment. To get access to them the RECEIVER PCB has to be installed underneath the cassette level and the TRANSMITTER PCB at the long MOUNTING BRACKET above it.

- 1. Switch off the ML700.
- 2. Open the TOP COVER, the right-hand SIDE PANEL and take off the REAR PANEL.
- **3**. Take out the defective SENSOR. (always replace RECEIVER and TRANSMITTER).
- 4. Disconnect the SENSOR from PCB A9 CONNECTORS A9X2 and A9X2A.

Note

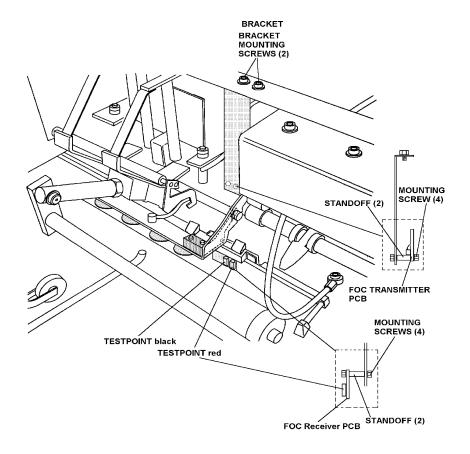
It might be possible that the distance between the 2 holes for mounting the FOC TRANSMITTER PCB are too close together. Enlarge the holes in the MOUNTING BRACKET as required. Be sure that the opening / closing of the EXIT DOOR does not interfere with the SENSOR.

- **5** Mount the new SENSOR PCBs. See the drawing on the next page.
- **6**. Connect the FOC TRANSMITTER to CONNECTOR A9X2 and the FOC RECEIVER PCB to CONNECTOR A9X2A.
- **7**. Switch on the ML700.
- **8**. Connect the DVM to the RECEIVER TEST POINTS (red and black).
- **9**. Change the position of the TRANSMITTER PCB until the voltage is below 500 mV. As the light distribution of the TRANSMITTER is not even across the illuminated area, it might be necessary to tilt the TRANSMITTER PCB sideways a small amount. If it is still not possible to achieve a voltage < 500 mV, then record the lowest possible voltage and proceed with step 10, or else proceed with step 13.
- 10. Connect the DVM with the GROUND LEAD to TP 2 of PCB A9. Connect the positive lead to the upper wire of RESISTOR R9 PCB A9. See the drawing on page 3-10..
- **11.** Adjust R27 until the voltage is the minimum value reached in step 9 + 400 mV.

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REPAIR KITS SM 3053-3

- 12. Connect the DVM to the RECEIVER TEST POINTS (red and black).
- **13.** Interrupt the light path with a fresh film. The voltage must now be higher than 1.5 V, or 400mV higher than the voltage set in step 11.
- 14. Ensure that the SENSOR WIRES are fixed with WIRE TIES.



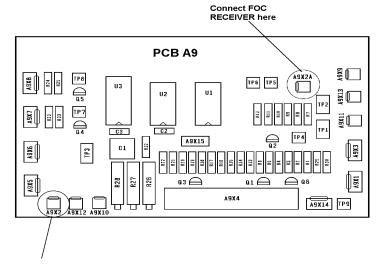


figure 3-6

SM 3053-3 REPAIR KITS

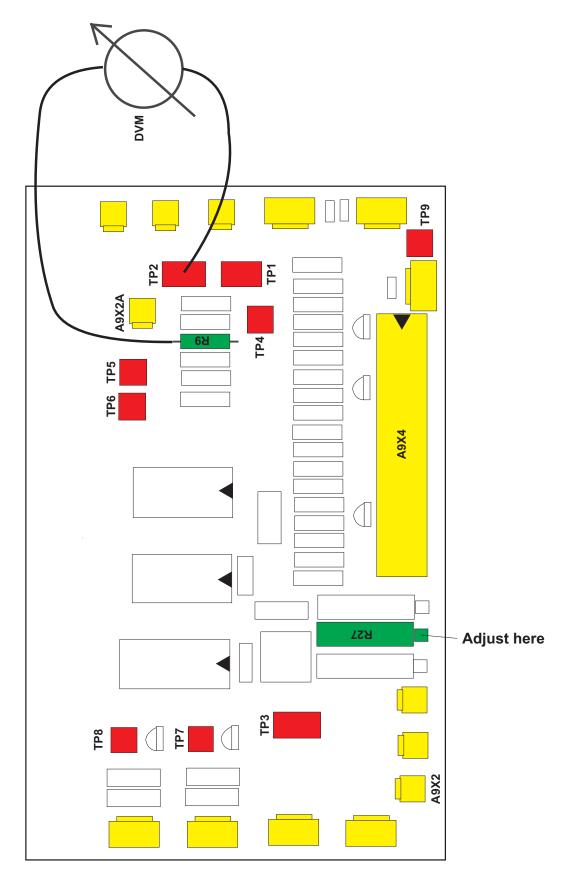


figure 3-7

REPAIR KITS SM 3053-3

EXIT DOOR SPRING ML700 Plus ONLY

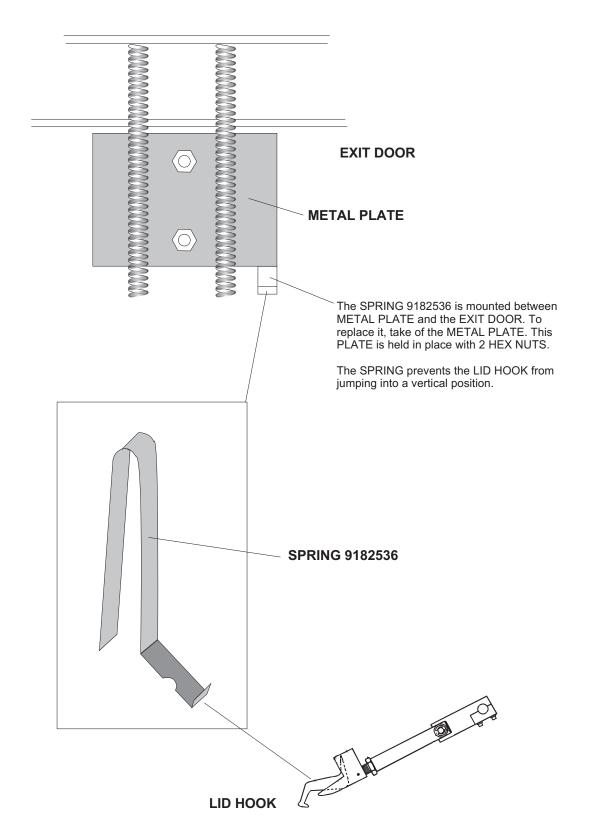


figure 3-8

SM 3053-3 REPAIR KITS

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CHAPTER 4

LINE VOLTAGE SETTING:

PURPOSE:

To obtain 220 V between Pin 5 and Pin 1 of the TRANSFORMER T1.

- 1. Disconnect the power from ML 700.
- 2. Remove TRANSFORMER COVER.

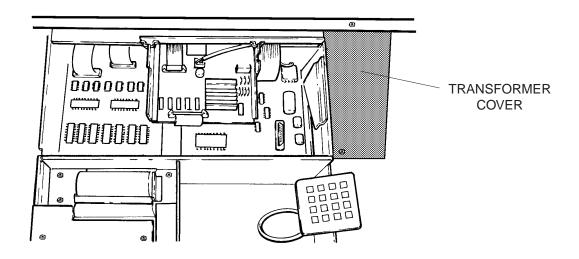
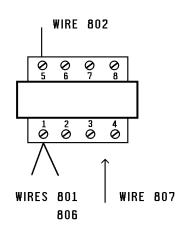


figure 4-1

- **3**. Measure Line Voltage.
- 4. Connect WIRE 807 to the corresponding TRANSFORMER TERMINAL.



LINE VOLTAGE	Connect WIRE 807 to TRANSFORMER TERMINAL
190 VAC	2
200 VAC	3
210 VAC	4
220 VAC	5
230 VAC	6
240 VAC	7
250 VAC	8

figure 4-2

5. Install TRANSFORMER COVER.

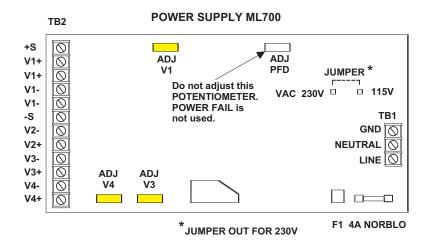
POWER SUPPLY

PURPOSE:

To set the OUTPUT VOLTAGES to the correct value.

1. Set V1, V2, V3 and V4 to the following values:

VOLTAGE	VALUE	ML700 Potentiometer	ML700 Plus Potentiometer
V1	5.2 V ± 51 mV	ADJ V1	ADJ V1
V2	24 V ± 1.2 V	not adjustable	ADJ V2
V3	24 V ± 1.2 V	ADJ V3	ADJ V3
V4	5.6 V ± 54 mV	ADJ V4	ADJ V4



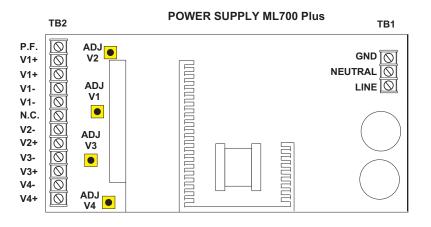


figure 4-3

2. Connect DVM to CAPACITOR C 21 on PCB A0. You should have 5.2 to 5.3 VDC. If not, reseat A0X7 and A1X20 CONNECTORS.

3. Check for any AC ripple across V4 on POWER SUPPLY. Should be < 100 mV AC ripple. If more replace POWER SUPPLY.

MAGAZINE OPENER

PURPOSE:

The MAGAZINE LID must be fully opened otherwise the MAGAZINE SUCKER BAR will hit the edge of the MAGAZINE LID.



MAGAZINE LID MUST NOT TOUCH THE BOTTOM OF THE MAGAZINE ABOVE.

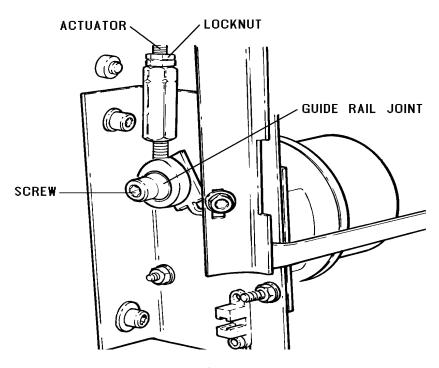


figure 4-4

- 1. Loosen LOCKNUT (left-hand thread).
- 2. Adjust length of ACTUATOR if necessary.
- 3. Enter SERVICE MODE. FDAB, Day, Day, 9,9
- 4. Select-Option 7.6 (Open-Close MAGAZINE).

5. Check Adjustment. The MAGAZINE LID should open fully. It must not touch the bottom of the MAGAZINE above.

- **6**. Check all MAGAZINES.
- 7. If the adjustment is not correct go to step 1.
- **8**. Close MAGAZINE.
- 9. Deenergize SOLENOID.
- 10. Fasten LOCKNUT.
- 11. Leave SERVICE MODE.
- 12. Key in 3585 to bring all MOTORS to HOME POSITION

MAGAZINE OPENER PHOTO SENSORS B21 (MMC), B20 (MMO)

PURPOSE:

SENSOR B21 (MMC) must be actuated when the GUIDE RAIL is down and SENSOR B20 (MMO) must be actuated when the GUIDE RAIL is up.

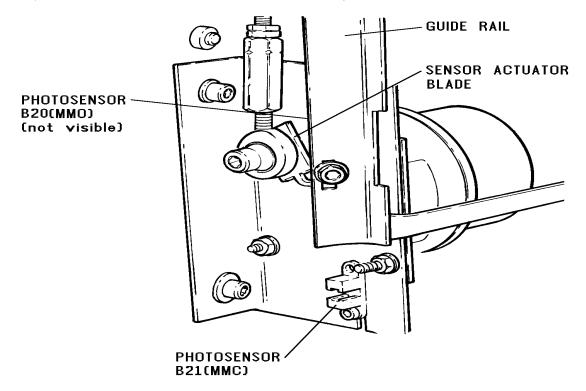


figure 4-5

- 1. Enter SERVICE MODE . FDAB Day, Day, 9,9.
- 2. Select option 6 (SENSOR TEST).
- 3. Move the GUIDE RAIL completely down.
- **4**. Adjust the position of the PHOTO SENSOR B21 (MMC), so that the SENSOR ACTUATOR BLADE is well in the SENSOR. Use the SENSOR TEST as an indication.
- **5**. Move the GUIDE RAIL completely up.
- **6**. Adjust the position of the PHOTO SENSOR B20 (MMO), so that the SENSOR ACTUATOR BLADE is well in the SENSOR. Use the SENSOR TEST as an indication.
- 7. If it is not possible to do the adjustment in step 4 or 6 check the adjustment of the MAGAZINE OPENER.
- **8**. Leave the SERVICE MODE.
- **9**. Key in 3585 to bring all MOTORS to HOME POSITION.

CASSETTE ENTRY

PURPOSE:

CASSETTE ENTRY should be smooth.



IF THE BRACKET IS ADJUSTED TOO LOW SWITCH S8 (PRL) WILL NOT BE ACTUATED.

1. Adjust ENTRANCE ROLLER until the CASSETTE moves on the ENTRANCE ROLLER and not on the ENTRANCE PLATE (stainless steel).

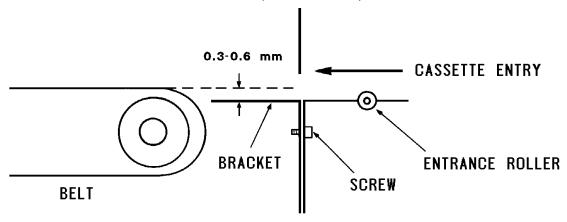


figure 4-6

- 2. Loosen SCREWS.
- 3. Adjust BRACKET to 0.3 0.6 mm below the BELT.
- 4. Fasten SCREWS.

CASSETTE INDUCTIVE SENSORS B28, B29

PURPOSE:

The INDUCTIVE SENSOR should recognise CASSETTES METAL EDGE.

1. Remove MOUNTING SCREW.

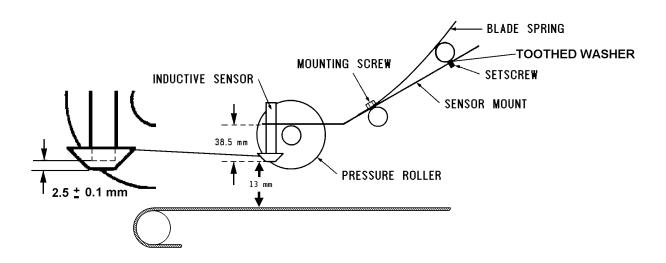


figure 4-7

Note

Step 2, 3, 4, 5 and 6 can only be done at ML700s up to approx. SN 2200 (50 Hz) and SN 6120 (60 Hz) where the GUIDE RING is not glued to the INDUCTIVE SENSOR.

- 2. Remove SENSOR MOUNT with INDUCTIVE SENSOR.
- 3. Loosen LOCK NUT.
- 4. Adjust GUIDE RING until it is 2.5 mm higher than the INDUCTIVE SENSOR.

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- 5. Tighten LOCK NUT.
- 6. Reinstall SENSOR MOUNT with INDUCTIVE SENSOR.
- 7. Adjust the SET SCREW until the SENSOR GUIDE RING is 13 mm above the BELT.
- **8**. Adjust the SET SCREW from step 7 until the GUIDE RING touches the thinnest CASSETTE.
- 9. Check that the thickest CASSETTE does not bend the SENSORS.

CASSETTE SUPPORT

PURPOSE:

The CASSETTE SUPPORT should be adjusted 0.5 - 0.7 mm below the BELT. If the CASSETTE SUPPORT is too low it will cause CASSETTE OPENING and CASSETTE CLOSING problems. If the CASSETTE SUPPORT is too high it will cause CASSETTE TRANSPORT problems, mainly with small CASSETTES.

1. Loosen the 2 MOUNTING SCREWS from the back.

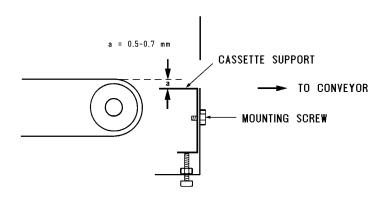


figure 4-8

2. Move the CASSETTE SUPPORT 0.5 to 0.7 mm below the TRANSPORT BELT. To do so turn the 2 ADJUSTMENT SCREWS in or out. The 2 ADJUSTMENT SCREWS are installed since SN 1110 and SN 5030.



The CASSETTE SUPPORT should rest on the 2 ADJUSTMENT SCREWS. Otherwise it moves down during a cycle.

- 3. Fasten the MOUNTING SCREWS and the LOCKNUT.
- 4. Check that:
 - CASSETTE TRANSPORT is ok,
 - CASSETTE OPENING is ok,
 - CASSETTE CLOSING is ok.

CASSETTE TRANSPORT

PURPOSE:

CASSETTE should be transported straight in and out.

1. Loosen MOUNTING SCREWS of left and right MOUNTING BRACKET.

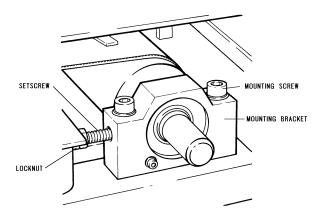


figure 4-9

- 2. Loosen left and right LOCKNUT.
- 3. Adjust the tension of the BELT with both SET SCREWS equally.
- 4. Check that a CASSETTE is transported correctly in and out.
- 5. Fasten LOCKNUTS.

6. Fasten MOUNTING SCREWS.

CASSETTE BELT MOTOR M1

PURPOSE:

The DRIVE SHAFT of the MOTOR should be aligned with the DRIVE SHAFT of the BELT.

1. Loosen MOUNTING SCREWS of the M1 MOTOR MOUNTING BRACKET.

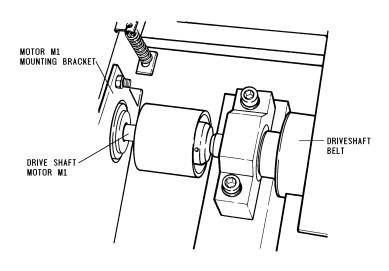


figure 4-10

- 2. Move MOUNTING BRACKET, until MOTOR DRIVE SHAFT is aligned with BELT DRIVE SHAFT.
- 3. Fasten MOUNTING SCREWS.

CASSETTE END SWITCH S13 (CES)

PURPOSE:

The CASSETTE END SWITCH should be actuated when the CASSETTE is 0.5 - 1 mm away from the CASSETTE STOP. Check that it is only actuated when both ACTUATORS are pushed back.

1. Loosen MOUNTING SCREWS of CASSETTE END SWITCH S13 (CES).

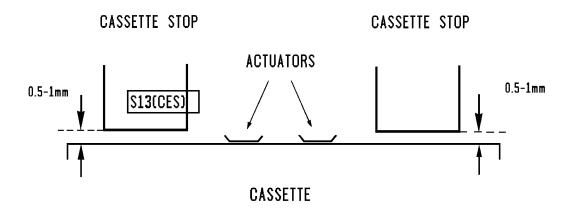


figure 4-11

- 2. Enter SERVICE MODE FDAB ,Day,Day,9,9.
- 3. Start option 6 (SENSOR TEST).
- 4. Place a CASSETTE 0.5 1 mm from the CASSETTE STOP.
- 5. Adjust S13 until the SENSOR TEST indicates that it is actuated.
- **6**. Check that S13 is only actuated when both ACTUATORS are pushed back.
- 7. Fasten MOUNTING SCREWS.
- 8. Leave SERVICE MODE
- 9. Key in 3585 to bring all MOTORS to HOME POSITION

CASSETTE CENTRING MOTOR M2

PURPOSE:

To set the innermost and outermost position of the CENTRING BARS.

1. Move CENTRING BARS fully out.

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2. Adjust STOP SCREW 1 until side 1of the ACTUATOR BRACKET is parallel to the MOTOR MOUNT.

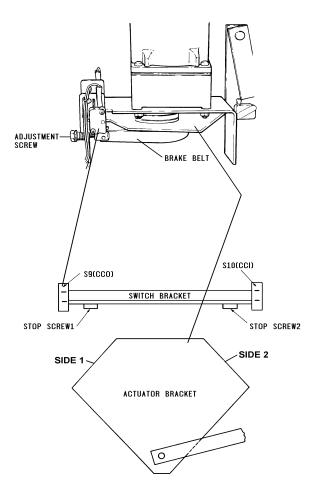


figure 4-12

- 3. Loosen the SWITCH BRACKET and adjust S9 to make it actuate 0.6 mm earlier.
- 4. Move CENTRING BARS completely in.
- **5**. Adjust STOP SCREW 2 until side 2 of the ACTUATOR BRACKET is parallel to the MOTOR MOUNT.
- **6**. Adjust S10 to make it actuate 0.6 mm earlier.
- 7. Fasten SCREWS and check adjustment again.

CASSETTE CENTRING BRAKE (ML700 without Mod 26)

PURPOSE:

The CENTRING BARS must open the correct distance, after a CASSETTE is centred.

- 1. Feed in a CASSETTE 18 x 24.
- 2. If the CENTRING BARS do not open for approx. 2 mm on each side of the CASSETTE after CENTRING readjust the BRAKE BELT TENSION with the Adjustment SCREW.

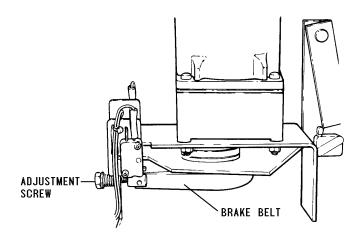


figure 4-13

- **3**. Feed in a CASSETTE 35 x 43 cm or 18 x 43 cm.
- **4**. The CENTRING BARS should now open 0.3 0.5 mm on each side after CENTRING. Readjust the BRAKE BELT Tension with the ADJUSTMENT SCREW if necessary.

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CASSETTE CENTRING BRAKE (ML700 with Mod 26 and ML700 Plus)

PURPOSE:

To ensure that the CASSETTE is centred properly and that there is a gap of 1 - 2 mm between the CASSETTE 18x24 cm X and the CENTRING BARS on each side.

Note

- This gap is smaller if larger CASSETTES are used
- Check the ADJUSTMENT OF CASSETTE CENTRING STOP SWITCHES S14/15 (CCS) first.
- No FILMS are required for this adjustment

Required Tools:

WRENCH 8 mm. Use WRENCH KIT PN G9901934 or TL2765.

- 1. Open the ML700 FRONT DOOR and take out the 7 Magazines to avoid fogging of fresh Films and close the FRONT DOOR.
- 2. Open the ML700 TOP COVER.
- 3. Take off the ML700 left-hand SIDE PANEL.
- 4. Actuate the INTERLOCK OVERRIDE SWITCH.
- Check that the BRAKE STOP just touches the BRAKE BELT TENSIONER. If it does
 not touch loosen the 2 MOUNTING SCREWS and move the BRAKE STOP in as
 required. Tighten the SCREWS.

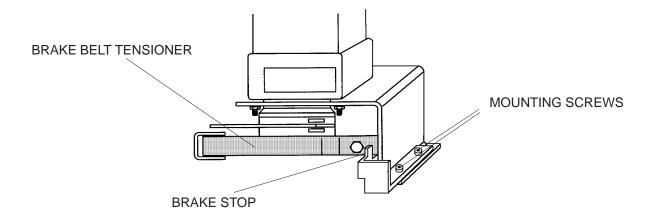


figure 4-14

- **6**. Feed a 18x24 cm CASSETTE into the ML700.
- 7. Observe that there is a gap of 1 2 mm between CASSETTE (18x24 cm) and CENTRING BAR after centring. This gap is smaller if larger CASSETTES are used
- 8. If the gap is too small the CASSETTE becomes clamped and might not be opened. If the gap is too big the CASSETTE will not be held down by the movable CENTRING BAR CLAMPS and might be pulled out of position by the CASSETTE SUCKER BAR.

If the gap is too small turn the ADJUSTMENT NUT ccw with an 8 mm WRENCH. If the gap is too big turn the ADJUSTMENT NUT cw with an 8 mm WRENCH.

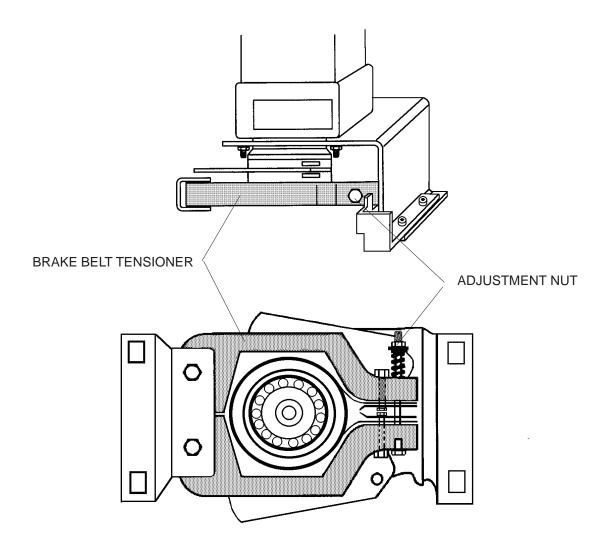


figure 4-15

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9. When the CASSETTE is clamped the 2 BRAKE BELT TENSIONERS make a slight movement. This movement can be minimised by repositioning the BRAKE STOP.

- 10. Check the adjustment with various cassette sizes.
- **11.** Enable the INTERLOCK OVERRIDE SWITCH, mount the SIDE PANEL and close the TOP COVER. Insert the MAGAZINES and close the FRONT DOOR.
- **12.** Run a few more cycles and ensure that the INTERLOCK SYSTEM is working.

CASSETTE CENTRING BARS

PURPOSE

CASSETTE CENTRING BARS should be at 90° angle to CASSETTE stop.

- 1. Move a CASSETTE to the CASSETTE STOP.
- 2. Close the CENTRING BARS.
- 3. Open the MOUNTING SCREWS.

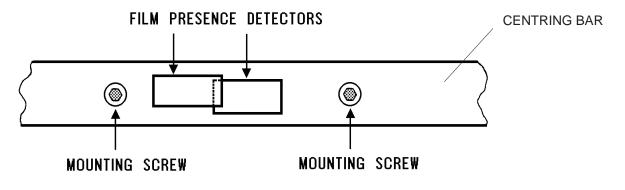


figure 4-16

- **4**. Make CENTRING BARS parallel to CASSETTE.
- 5. Fasten MOUNTING SCREWS.
- **6**. Open CENTRING BARS and take out CASSETTE.

CASSETTE CENTRING STOP SWITCHES S14/15 (CCS)

PURPOSE:

The 2 switches S14/15 should be actuated, when there is a clearance of 0.6 - 0.8 mm between the CENTRING BARS and a CASSETTE.

- 1. Start the Service Mode FDAB, Day, Day, 9,9.
- 2. Select Option 7.1(Feed CASSETTE)
- 3. Feed in a CASSETTE.
- 4. Start SENSOR TEST.
- 5. Move CENTRING BARS in by hand.



Caution

CHECK THAT THE SWITCHES ARE NOT ACTUATED TOO EARLY. OTHERWISE THEY MIGHT BE DAMAGED.

6. With a clearance of 0.6 - 0.8 mm between CENTRING BARS and a CASSETTE adjust S14/15 until they are actuated.

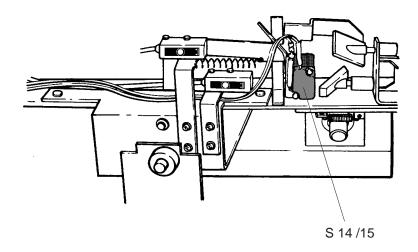


figure 4-17

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- 7. Leave SENSOR TEST.
- **8**. Eject the CASSETTE.
- 9. Leave SERVICE MODE.
- **10.** Key in 3585 to bring all MOTORS to HOME POSITION.

CASSETTE CENTRING

PURPOSE:

The CENTRE of the CASSETTE CENTRE should be aligned with the CENTRE of the MAGAZINE CENTRE in order to transport the unexposed FILM correctly into the CASSETTE.

- 1. Feed in an empty X-Omat CASSETTE (largest size available).
- 2. During loading observe that the FILM is centred in the CASSETTE.
- 3. If the FILM is not centred within \pm 0.5 mm do step 4. Otherwise do step 5.
- **4**. Loosen the 4 BELT SUPPORT MOUNTING SCREWS. Move the BELT SUPPORT to the desired place. Do step 1 to 3 again.

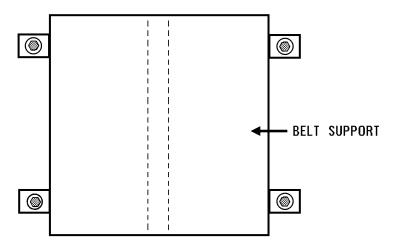


figure 4-18

- 5. Fasten the BELT SUPPORT MOUNTING SCREWS.
- **6**. Remove the CASSETTE.
- 7. Remove fogged film from CASSETTE.
- **8**. Check that 18 x 43 and 35 x 43 FILMS do not hit the FRAME of the CONVEYOR.

CASSETTE WIDTH S2 (CW0), S3 (CW1) CASSETTE OPEN S1 (CO)

PURPOSE:

To detect the correct CASSETTE WIDTH and that the CASSETTE is open.

- 1. Enter SERVICE MODE FDAB ,Day,Day,9,9.
- 2. Select Option 6 (SENSOR TEST).
- 3. Lower SWITCH BRACKET until the SWITCHES are riding on their ACTUATORS. SWITCH S5 PRU is now actuated.

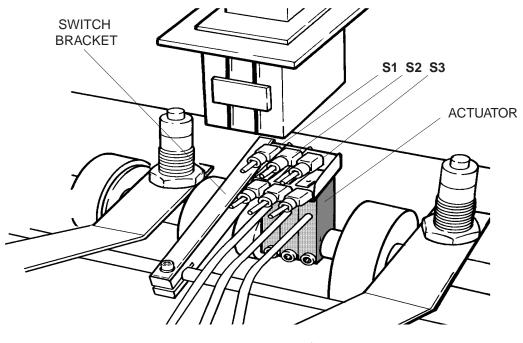


figure 4-19

4. Fasten the SWITCH BRACKET.

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5. Rotate SWITCHING SHAFT until the CASSETTE OPENER BRACKET is parallel to the CASSETTE TRANSPORT BELT.

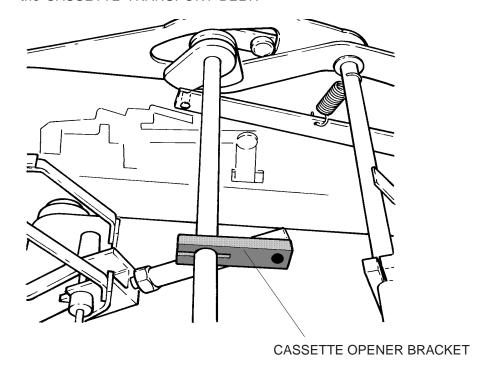


figure 4-20

6. Lift the ACTUATOR WIRE of S2 and S3 with a CASSETTE. SWITCHES S2 and S3 must now be actuated. If not, lower the SWITCH BRACKET.

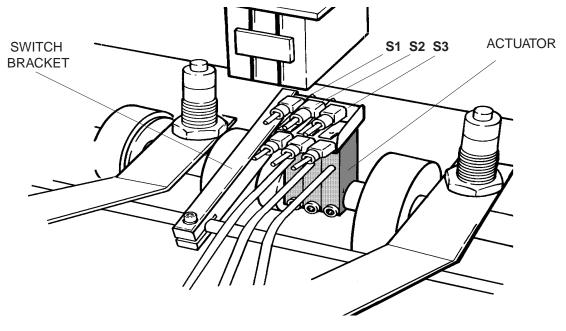


figure 4-21

7. Lift the ACTUATOR WIRE of S1 (CO) for 40 mm. S1 must now be actuated.

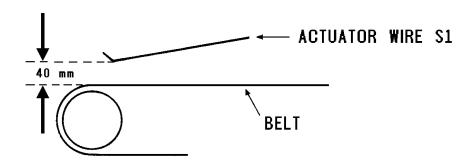


figure 4-22

- **8**. If necessary, CAREFULLY bend the ACTUATOR WIRE of S1.
- 9. Leave SERVICE MODE.
- 10. Key in 3585 to bring all MOTORS to HOME POSITION.

CASSETTE LENGTH DETECTION

PURPOSE:

To set the INDEX BAR (Slotted Bar) that the correct number of CASSETTE LENGTH PULSES is counted. This number combined with the actuation of SWITCH S2(CW2) and S3(CW3) gives the CASSETTE SIZE.

Note

This adjustment can be done with the following cassette lengths: 40~cm~X, 35~cm~X, 30~cm~X, 24~cm~X 10~in~V, 10~in~X, (X=X-OMATIC V=VIDEO FILM HOLDER)

- 1. Enter SERVICE MODE. FDAB ,Day,Day,9,9
- 2. Select Option 7.1 Feed in a CASSETTE.
- 3. Select OPTION 6 (SENSOR TEST).
- **4**. Manually move in the CENTRING BARS until the SWITCHES S 14/15 (CCS) are actuated.

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5. Measure the distance from the CENTRING BAR to the SENSOR B1 (CS).

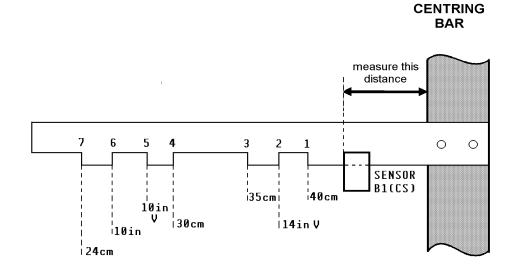


figure 4-23

- 6. Move CENTRING BARS out.
- 7. Move CENTRING BARS in again until the correct edge of the INDEX BAR (depending on the selected CASSETTE) is detected by the SENSOR B1 (CS).
- **8**. Measure the distance from the CENTRING BAR to the SENSOR B1 (CS). Calculate the difference between the measurements in step 8 and step 5. Compare it with the following list:

CASSETTE	Difference between Step 8 and Step 5
40 cm X	8.0 ± 0.3 mm
35 cm X	8.5 ± 0.3 mm
30 cm X	8.0 ± 0.3 mm
24 cm X	4.0 ± 0.3 mm
10 in X	7.0 ± 0.3 mm
10 in V	2.2 ± 0.3 mm

- **9**. If the difference is not correct open the MOUNTING SCREWS and move the INDEX BAR for the required distance.
- 10. Fasten the MOUNTING SCREWS.

- 11. Check the adjustment with all cassette sizes.
- 12. Take out the CASSETTE.
- 13. Leave the SERVICE MODE.
- 14. Key in 3585 to bring all MOTORS to HOME POSITION

CASSETTE CENTRING CLUTCH

PURPOSE:

To maintain the correct torque of the CLUTCH.

Due to the wear of the CASSETTE CENTRING CLUTCH, the torque is reduced over the time. To compensate for this, tighten the CASSETTE CENTRING CLUTCH by 1 step every 400000 actuations.

- 1. Take out the COUNTERSUNK SCREW.
- Turn the CLUTCH RING 1 step clockwise and fix it again with the COUNTERSUNK SCREW.

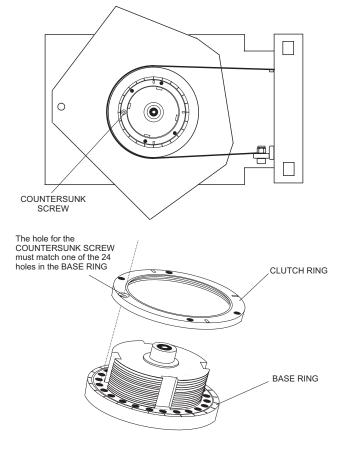


figure 4-24

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CASSETTE OPENER OPENER LENGTH ADJUSTMENT

Note

Before doing this adjustment, check that the CASSETTE SUPPORT is adjusted to the correct height. See page 4-7.

PURPOSE:

To open CASSETTES correctly.

1. Move CASSETTE OPENER BRACKET to form a straight line with the CASSETTE OPENER SHAFT. Fix position with OPENER TOOL PN 9193396.

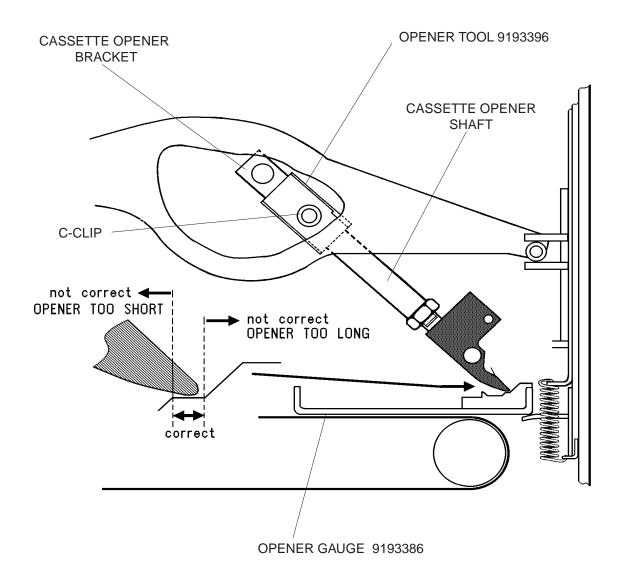


figure 4-25

2. Move OPENER GAUGE PN 9193386 to the CASSETTE STOP. Check that OPENER is located on the OPENER GAUGE. See the drawing on the previous page.

- 3. If length is not correct remove OPENER TOOL PN 9193396. Remove CIRCLIP and WASHER from CASSETTE OPENER BRACKET. Remove CIRCLIP from SHAFT with ROLLERS. Remove SHAFT with ROLLERS. Remove CASSETTE OPENER.
- 4. Loosen NUT. Turn SHAFT to adjust for correct length.

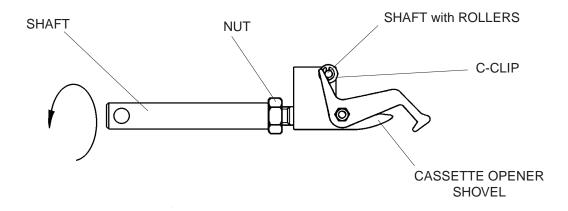


figure 4-26

- 5. Reinstall CASSETTE OPENER without using CIRCLIPS and WASHERS.
- **6**. Check again length of CASSETTE OPENER as described in step 1 and 2. Repeat adjustment until length of CASSETTE OPENER is correct.
- 7. Reinstall WASHER and CIRCLIPS to the CASSETTE OPENER.

Note

Check that the TIP of the CASSETTE OPENER SHOVEL stays parallel to the CASSETTE TRANSPORT BELT.

8. Fasten NUT on CASSETTE OPENER.

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CASSETTE OPENER ADJUSTMENT

PURPOSE

To ensure that the CASSETTES are opened correctly.



Caution

Check that the OPENER SHOVEL is the correct length.

- 1. Manually insert a CASSETTE and place in the centred position. Check that the CASSETTE is tight against the STOP at the CASSETTE END SWITCH.
- 2. Rotate the CASSETTE OPENER BRACKET fully up to the position in the illustration.
- 3. Check that the 2 EXIT DOOR BRACKET CAMS are parallel and in the same position as shown below on the EXIT DOOR BRACKET.

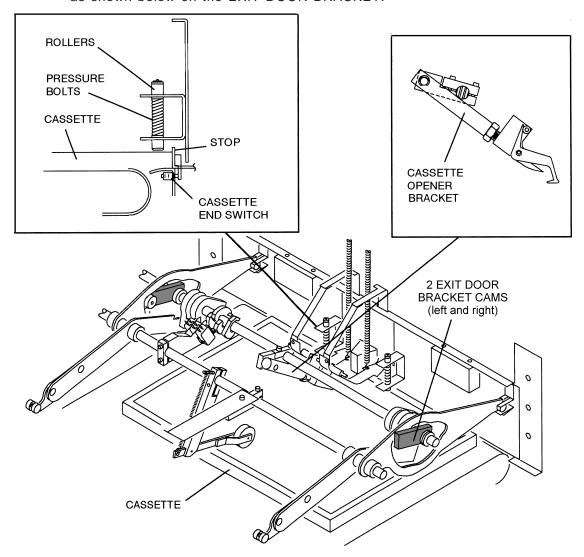


figure 4-27

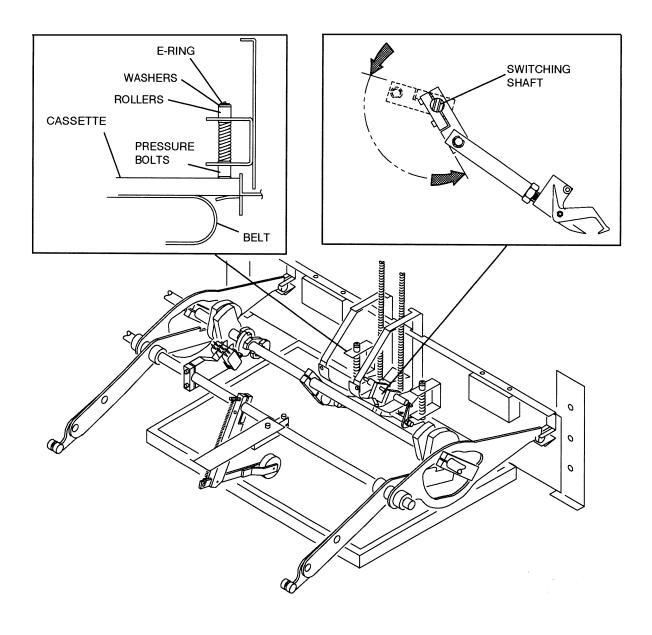


figure 4-28



Caution

The WASHERS prevent the PRESSURE BOLTS from pressing excessively on the CASSETTE and causing the MOTOR to stall.

4. Manually move the CASSETTE OPENER BRACKET down and toward the PROCESSOR until you see the E-RING lift from each WASHER.



If the CASSETTE lifts from the BELT, adjust the CASSETTE SUPPORT.

- 6. Now move the CASSETTE OPENER BRACKET down until
 - the PRESSURE BOLTS press onto the CASSETTE LID
 - the pressure on the PRESSURE BOLTS is released
 - the PRESSURE BOLTS touch the CASSETTE LID again without pressure.

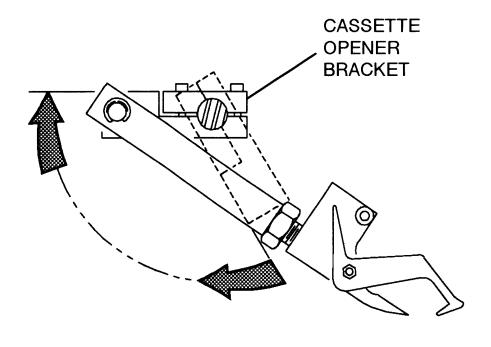


figure 4-29

- **7**. Check that the CASSETTE rests tightly at the STOP and the PRESSURE BOLTS rest on the CASSETTE LID.
- **8**. Use a 2 mm Allen WRENCH to check the clearance between the edge of the OPENER SHOVEL and the CASSETTE LATCH.
- **9**. If the clearance is not correct, loosen the 2 SCREWS of the CASSETTE OPENER BRACKET and move the OPENER SHOVEL to a distance of 2 mm (0.08 in.) from the CASSETTE LATCH.
- 10. Tighten the 2 SCREWS of the CASSETTE OPENER BRACKET.

11. Check the clearance again.

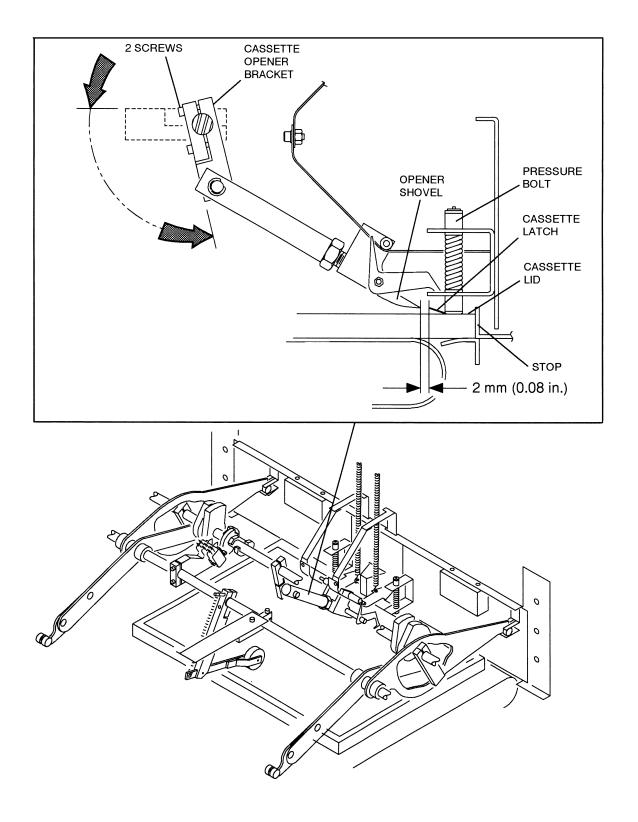


figure 4-30

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12. Move the CASSETTE OPENER BRACKET up fully and toward the front of the MULTILOADER.

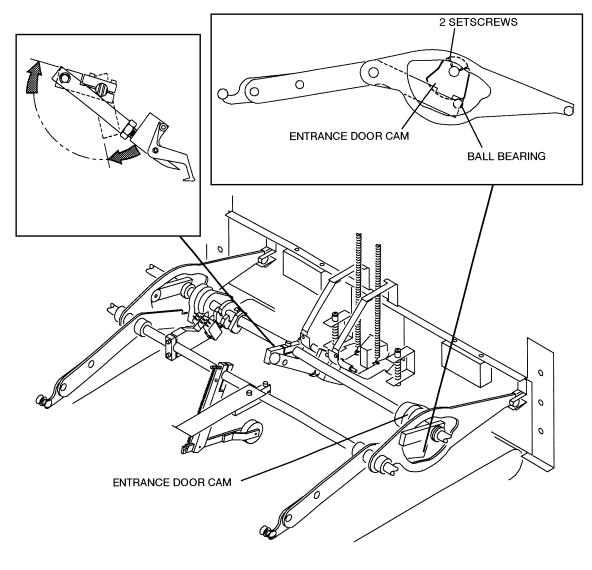


figure 4-31

- **13.** Remove the CASSETTE.
- **14.** Check the alignment of the edges of the ENTRANCE DOOR CAM and the BALL BEARING. If necessary:
 - Loosen the 2 SETSCREWS.
 - Adjust the 2 ENTRANCE DOOR CAMS.
 - TIGHTEN the 2 SETSCREWS.
 - Check again.

15. Move the CASSETTE OPENER BRACKET down slightly until the EXIT DOOR starts to move.

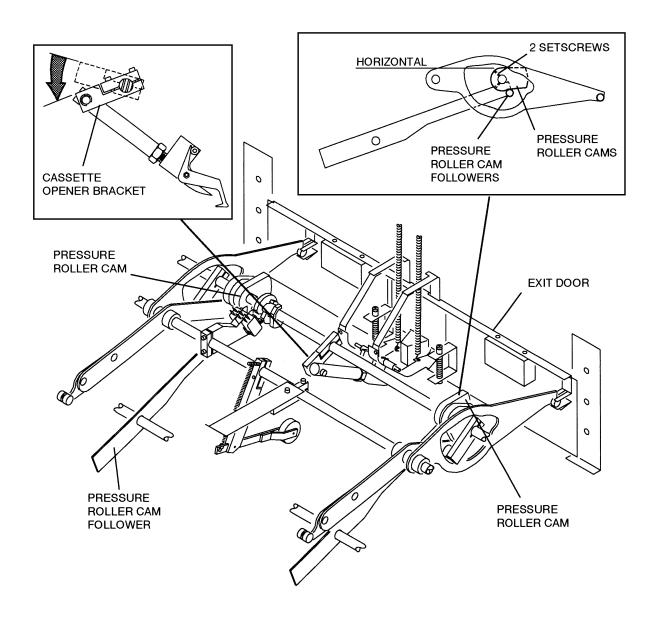


figure 4-32

- **16.** Check that the PRESSURE ROLLER CAMS are parallel and in the horizontal position. If necessary:
 - Loosen the 2 SETSCREWS
 - Adjust the PRESSURE ROLLER CAMS to be horizontal. The PRESSURE ROLLER CAM FOLLOWER touches the bottom of the CAM.
 - Tighten the 2 SETSCREWS.
 - Check again.

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- 17. Check that the 2 S6 CAMS deactuate S6. If necessary:
 - Loosen the SETSCREWS.
 - Adjust the position of the CAMS.
 - Tighten the SETSCREWS.
 - Check again.

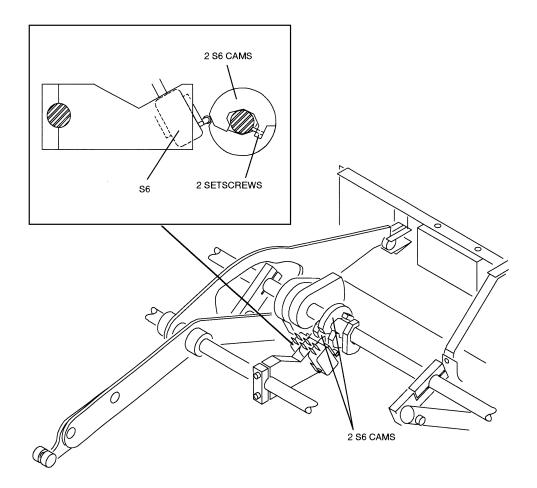


figure 4-33

- **18.** Lift the CASSETTE OPENER BRACKET until the edges of the 2 PRESSURE ROLLER CAMS reach the centre of the CAM FOLLOWER. See the drawing on the next page.
- **19.** Check that the CAM of S5 actuates S5. See the drawing on the next page. If necessary:

- Loosen the SETSCREW.
- Adjust the position of the CAM.
- Tighten the SETSCREW.
- Check again.

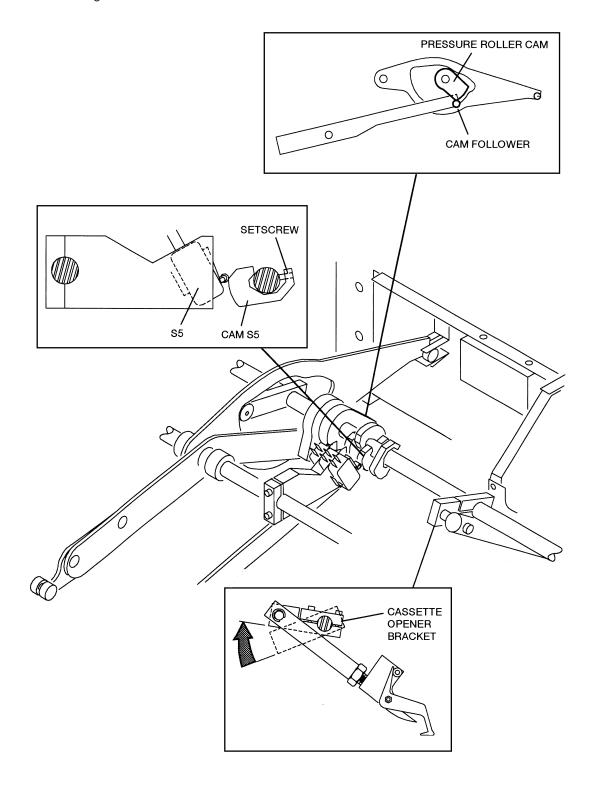


figure 4-34

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- **20.** Move the CASSETTE OPENER BRACKET up to the vertical position and rotate approximately 3°.
- **21.** Check that the CAM of S4 actuates S4. If necessary:
 - Loosen the SETSCREW.
 - Adjust the position of the CAM.
 - Tighten the SETSCREW.

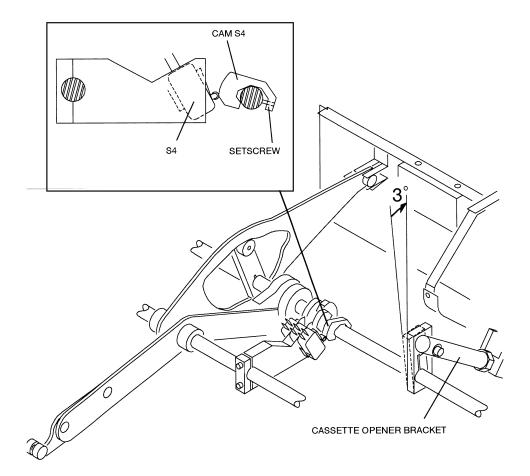


figure 4-35



Important

Check that the CASSETTE is tight against the STOP.

22. With an 18x24 cm or 8x10 in. CASSETTE opened and in centre position, move the CENTRING BARS to the home-position.

23. Use a STEEL RULE TL 4060 to check that the distance between the BELT and the top corner of the CASSETTE is 95 mm (3.75 in.) or greater.

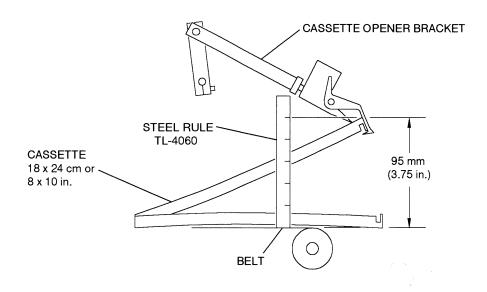


figure 4-36

- **24.** If the distance is not correct:
 - Rotate the CASSETTE OPENER BRACKET counter clockwise to make the height of the top corner of the CASSETTE correct.
 - Adjust the position for the CAM of S4 to actuate S4.



If the opening height of the CASSETTE was changed, the relationship of the reflective stickers on the LID SCREEN and the TOP SURFACE of the CASSETTE with the FILM PRESENCE DETECTOR and TYPE 2 SENSOR may have changed. In this case do the CASSETTE FILM PRESENCE DETECTOR and TYPE 2 SENSOR adjustment (page 4-49).

- **25.** Energise the MULTILOADER.
- 26. Place all MOTORS in the HOME POSITION.

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- **27.** Enter:
 - 3585
 - 9
 - 9
- 28. Enter the SERVICE MODE.
- 29. Advance to the SENSOR TEST.
- **30.** Open the left SIDE DOOR.
- **31.** Insert the thinnest CASSETTE available.
- ${f 32.}$ Check that S8 is deactuated. If necessary:
 - Loosen the SETSCREW.
 - Adjust the position of the ACTUATOR for S8.
 - Tighten the SETSCREW.
 - Check again.

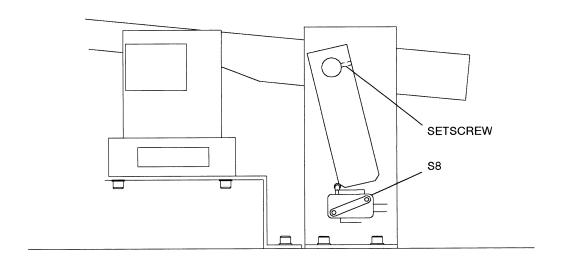


figure 4-37

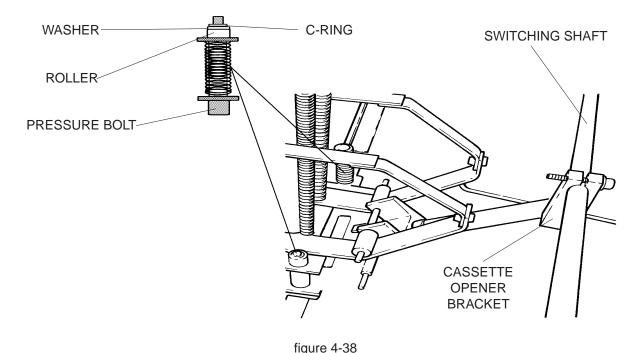
- **33.** While the CASSETTE is removed, check that SWITCH S8 is actuated.
- **34.** Lift the CASSETTE OPENER BRACKET up fully.
- **35.** Rotate the CASSETTE OPENER BRACKET down slowly. Check that S8 actuates before S6 deactuates.
- **36.** Exit the SERVICE MODE.
- **37.** Using at least one of each size and type of CASSETTE, check that the MULTILOADER operates correctly.

ADJUSTMENT OF PRESSURE BOLTS

PURPOSE:

The PRESSURE BOLTS are for relaxing the tension of the CASSETTE LATCH. This allows easy unlatching and closing of the CASSETTE.

- 1. Feed in thinnest CASSETTE available to the CASSETTE STOP.
- 2. Rotate the SWITCHING SHAFT until the PRESSURE BOLTS reach their lowest position. Check that the CASSETTE is not lifted from the BELT. If this occurs adjust the CASSETTE SUPPORT.
- 3. Check that the WASHERS rotate freely. If they are tight remove the appropriate amount of WASHERS.



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ADJUSTMENT OF CASSETTE SUCKER BAR (ML700 without Mod 28)

PURPOSE:

To optimise position of CASSETTE SUCKER BAR in CASSETTE for unloading of exposed FILM.

- 1. Open TOP COVER.
- 2. Enter TEST MODE.
- **3**. Key in 3, 1, 8 (OPEN CASSETTE).
- 4. Move OPENER GAUGE 9193386 to the CASSETTE STOP.

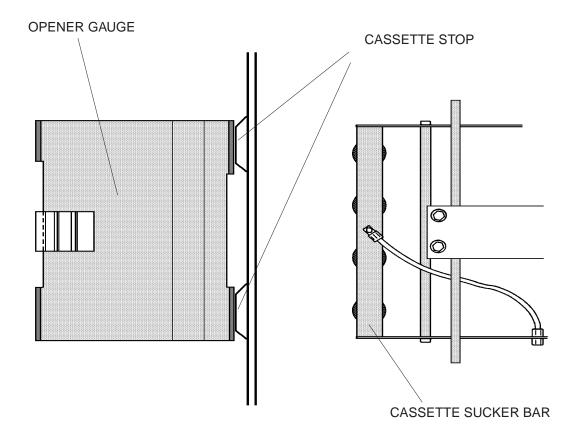


figure 4-39

5. Move CASSETTE SUCKER BAR by hand onto OPENER GAUGE 9193386. There should be a clearance of approximately 2.5 mm between SUCKER BAR MOUNTS and the cut-out of the SUCKER BAR CAMS. If necessary adjust STOP1.

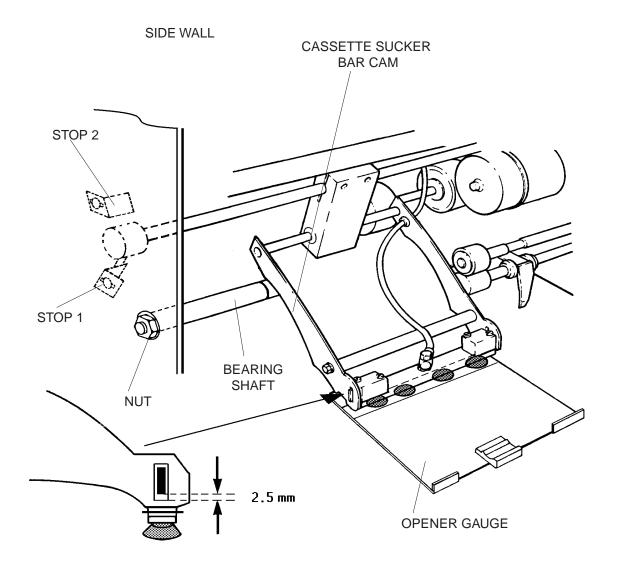


figure 4-40

6. Check that the SUCKERS are located between the two lines on the OPENER GAUGE 9193386. Check that OPENER GAUGE 9193386 rests tightly at the CASSETTE END STOP.

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7. If the adjustment is not correct remove REAR COVER, loosen NUT on BEARING SHAFT and rotate BEARING SHAFT up or down until SUCKER BAR is placed on OPENER GAUGE as shown on figure 68. Check the adjustment by moving the CASSETTE SUCKER BAR in and out. Check that the CASSETTE SUCKER BAR CAMS do not touch either the edge of OPENER GAUGE 9193386 or the CASSETTE STOP. If they do so raise the BEARING SHAFT.

- **8**. Check that the OPENER GAUGE is still at the CASSETTE STOP.
- **9**. Slightly loosen SCREW ON CAM for SWITCH S11 so that the CAM can be moved by hand. The CAM should still be tight enough to actuate SWITCH S11.

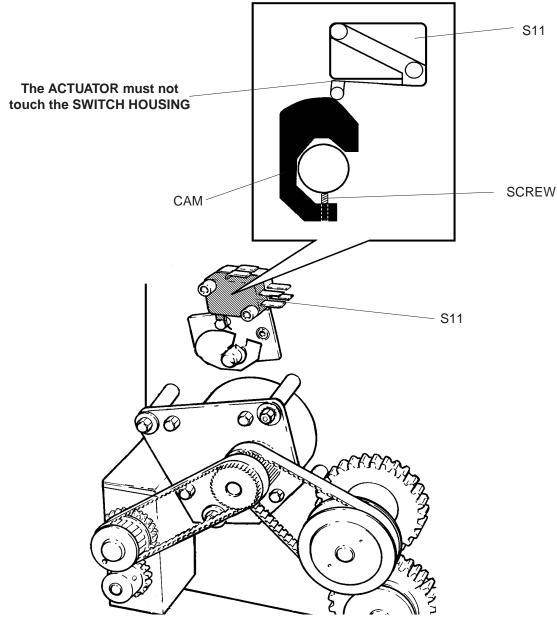


figure 4-41

10. Move the CASSETTE SUCKER BAR onto OPENER GAUGE as shown by manually turning the DRIVE SHAFT. If necessary adjust STOP1.

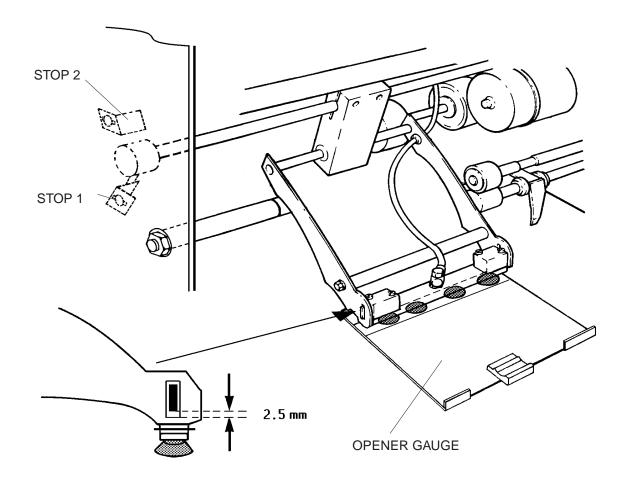


figure 4-42

Note

To make sure that the MOTOR for the CASSETTE SUCKER BAR starts immediately when Key 5 is pressed: Softly lift the MOUNTING BRACKET for the CASSETTE SUCKER BAR when you press Key 5. Do not lift too strong because the CASSETTE SUCKER BAR should only be moved by MOTOR for adjustment!

- 11. Key in 4, 5 (CASSETTE SUCKER BAR BACK 100 MS usw).
- **12.** Adjust CAM (do not turn the DRIVE SHAFT) for SWITCH S11 so that SWITCH S11 just actuates. Tighten the CAM SCREW.

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13. Key in 2, 1 (BACK / TAKE) and check if CASSETTE SUCKER BAR is located on OPENER GAUGE. If necessary readjust CAM for SWITCH S11.

14. Adjust STOP1 for the DRIVE SHAFT of the CASSETTE SUCKER BAR to a clearance of approx. 2 mm to the STOP SCREW on the DRIVE SHAFT.

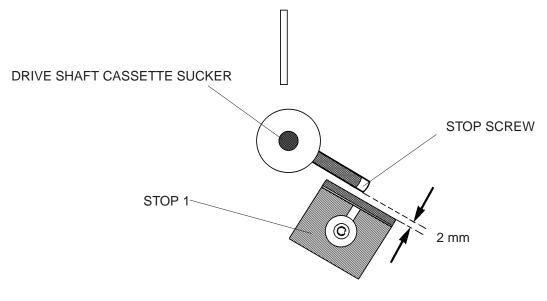


figure 4-43

15. Move CASSETTE SUCKER BAR out manually to a clearance of 3 mm between SUCKER BAR CAM and DRIVE SHAFT of SUCKER BAR. If necessary loosen STOP2.

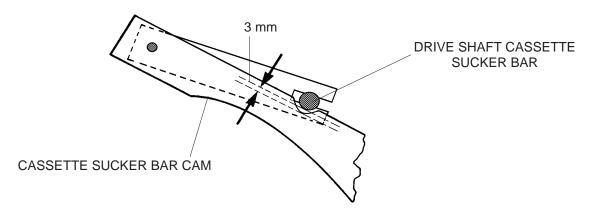


figure 4-44

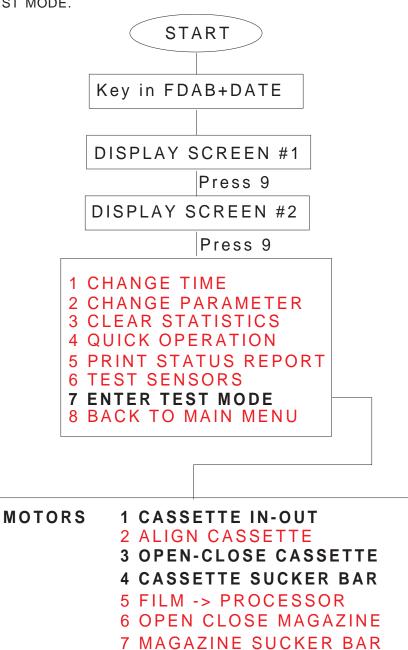
- **16.** Adjust S12 to actuate.
- **17.** Adjust STOP 2 for the DRIVE SHAFT of the CASSETTE SUCKER BAR to a clearance of approx. 1 mm to the STOP SCREW on the DRIVE SHAFT.

ADJUSTMENT OF CASSETTE SUCKER BAR (ML700 with Mod 28 and ML700 Plus)

PURPOSE:

To optimise position of CASSETTE SUCKER BAR in CASSETTE for unloading of exposed FILM.

- 1. Open TOP COVER.
- 2. Actuate the INTERLOCK OVERRIDE and switch on the ML700.
- 3. Enter TEST MODE.

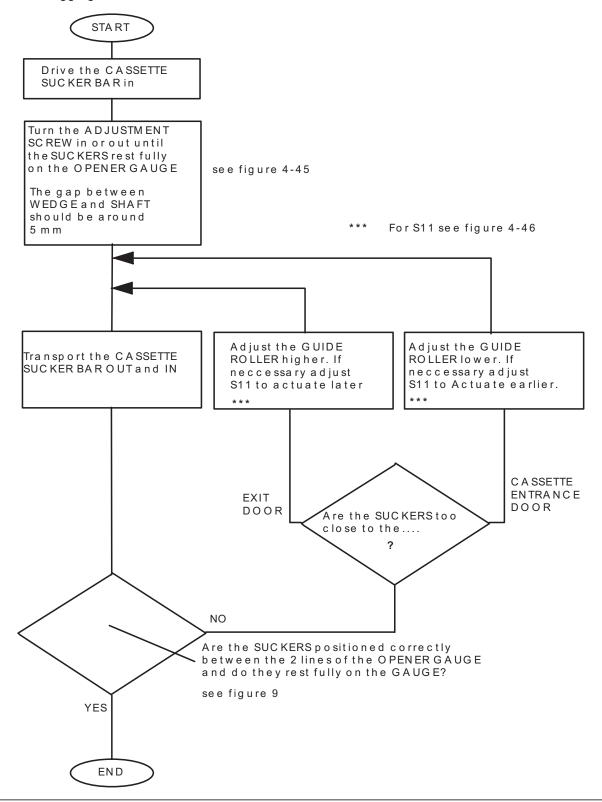


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8 NEXT PAGE

4. Feed in OPENER GAUGE PN 9193386 (TL 4804) into the MULTILOADER and open the EXIT DOOR. Use OPTIONS CASSETTE IN-OUT and OPEN EXIT DOOR.

5. Do the CASSETTE SUCKER BAR adjustment. If possible use TEST FILMS to avoid fogging of CUSTOMER FILMS.



6. Tighten the LOCK NUT of the ADJUSTMENT SCREW. If this LOCK NUT is not tight, the setting of the ADJUSTMENT SCREW might change due to vibrations.

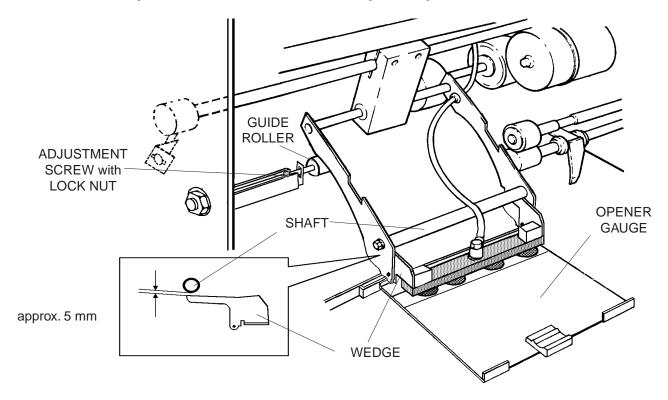


figure 4-45

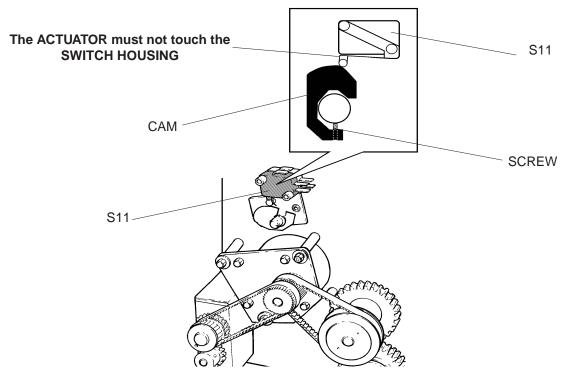


figure 4-46

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7. Transport the CASSETTE SUCKER BAR out and back in again. Adjust STOP 1 for the DRIVE SHAFT of the CASSETTE SUCKER BAR to a clearance of approx. 1 mm to the STOP SCREW on the DRIVE SHAFT.

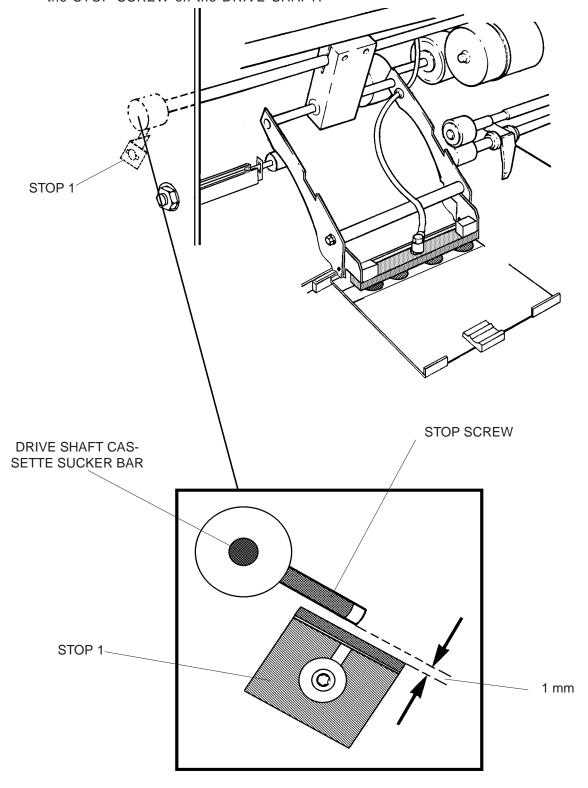


figure 4-47

8. Move the CASSETTE SUCKER BAR out manually to a clearance of 1 mm between SUCKER BAR CAM and the DRIVE SHAFT of the SUCKER BAR.

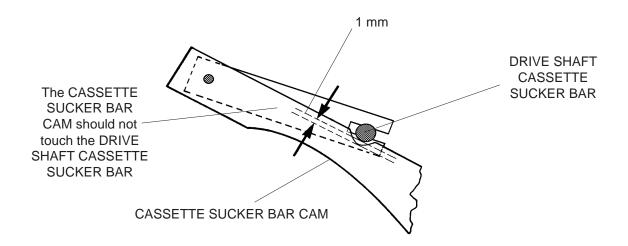


figure 4-48

9. Adjust S12 to actuate.

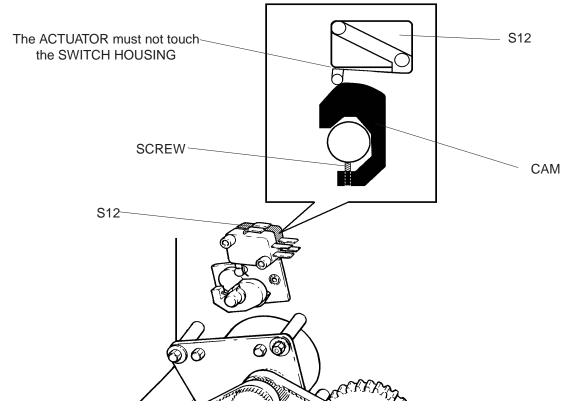


figure 4-49

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10. Take out the OPENER GAUGE

```
Press 2 (BACK) until the CASSETTE SUCKER BAR is fully withdrawn

Press 8

Press 3 (OPEN _ CLOSE CASS.)

Press 2 (CLOSE)

Press 8

Press 1 (CASSETTE IN-OUT)

Press 4 (FEED OUT UNSWITCHED) and take the OPENER GAUGE out of the ML700

Press 8 3 times
```

Press 2 (CHANGE PARAMETERS)

Press 8 twice

Press 7 (ENABLE OPERATION)

Press 1

Press 8 twice

11. Run several cycles with various CASSETTE sizes..

CASSETTE BLOW PIPES

PURPOSE:

Air pressure from the BLOW PIPES should lift the FILM from the CASSETTE LID.

- 1. Take a CASSETTE 18x24 cm.
- 2. Enter SERVICE MODE FDAB, DAY, DAY, 9, 9.
- 3. Select OPTION 7.1 (FEED CASSETTE) and feed in the CASSETTE.
- 4. Select OPTION 7.2 (ALIGN CASSETTE) and centre the CASSETTE.
- 5. Select OPTION 7.3 (OPEN CASSETTE) and open the CASSETTE.
- **6**. Loosen the SETSCREWS of the BLOW PIPES.

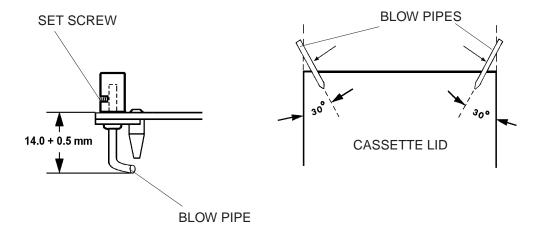


figure 4-50

- **7**. Check for a distance of 14 to 14.5 mm between tip of BLOW PIPES and the upper edge of the PLATE.
- 8. Adjust BLOW PIPES to an angle of approx. 30 degrees to the CASSETTE EDGE.
- 9. Fasten SETSCREWS.
- 10. Leave SERVICE MODE.
- 11. Key in 3585 to bring all MOTORS to HOME POSITION.

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CASSETTE FILM PRESENCE DETECTOR and CASSETTE TYPE 2 SENSOR.

PURPOSE:

To align the FILM PRESENCE DETECTORS to the MIRRORS and to the REFLECTIVE STICKERS in the CASSETTE, to obtain maximum output.

Note

The same procedure is used for FILM PRESENCE DETECTOR TOP (FPDT) and FILM PRESENCE DETECTOR BOTTOM (FPDB).

- 1. Start the SERVICE MODE FDAB ,Day,Day,9,9.
- 2. For TYPE 2 SENSOR continue with step 19.
- 3. Select option 7.1(FEED CASSETTE). Feed in a CASSETTE 18x24 cm.
- 4. Select Option 7.2 (ALIGN CASSETTE). Centre CASSETTE.
- 5. Select Option 7.3 (OPEN CASSETTE). Open CASSETTE.
- 6. Loosen the SENSOR and BRACKET SCREWS.

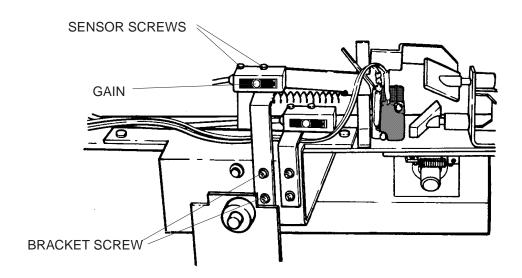


figure 4-51

7. Set GAIN of the SENSOR to maximum.

8. Change the position of the FILM PRESENCE DETECTOR and observe the INDICATOR LED until it lights green.

9. Reduce the GAIN (turn the GAIN POT. counterclockwise) of the SENSOR until the INDICATOR LED goes red and then increase the GAIN again by one step clockwise. This makes the SENSOR most sensitive to position changes.

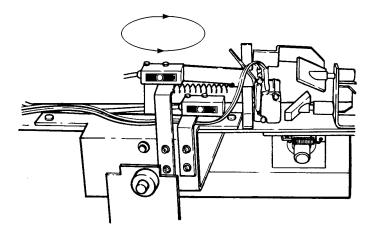


figure 4-52

- **10**. Move SENSOR from left to right. Locate left and right position where the SENSOR LED lights red. Set SENSOR midway between.
- 11. Fasten SENSOR SCREWS.
- **12**. Move SENSOR forward and backward to find both positions where the SENSOR LED lights red. Set SENSOR midway between.

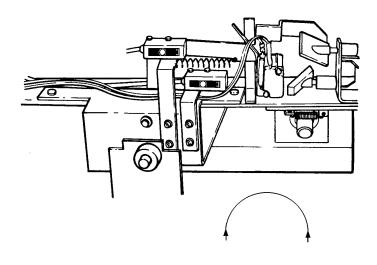


figure 4-53

- 13. Fasten BRACKET SCREWS.
- 14. Rotate GAIN CONTROL counter clockwise until LED lights red.
- 15. Rotate GAIN CONTROL 2 steps clockwise.
- 16. Close CASSETTE and remove it from the ML 700.
- 17. Check the adjustment with a CASSETTE 35 x 43 cm.
- 18. TYPE 2 SENSOR
- 19. Feed in a TYPE 2 CASSETTE
- 20. Select Option 7.2 (ALIGN CASSETTE). Centre CASSETTE.
- **21**. Repeat STEP 6 to 16.
- **22**. Check the adjustment with another TYPE 2 CASSETTE.
- 23. Key in 3585 to bring all MOTORS to HOME POSITION.

FILM OUT OF CASSETTE SENSOR B6 (FOC) ML700 only (old style version)

PURPOSE:

To set the sensitivity of the SENSOR to give correct output when it is covered by a FILM.

- 1. Connect positive lead of DVM to Pin 11of U1 on PCB A9. Connect negative lead of DVM to TP2 of PCB A9.
- 2. Without a FILM the voltage reading should be + 0.7V. If the voltage is higher readjust the mechanical position of SENSOR B6 (FO).
- 3. Connect positive LEAD of DVM to PIN 10 of U1 on PCB A9
- 4. Cover SENSOR B6 with a film and adjust R27 to +0.9V.



Step 2. Without a FILM the voltage should be + 0.7 V

Step 4. Cover SENSOR B6 with a FILM and adjust R27 to + 0.9 V

figure 4-54

FILM OUT OF CASSETTE SENSOR B6 (FOC) ML700 only (intermediate style version PN 9194416)

PURPOSE:

To set the sensitivity of the SENSOR to give correct output when it is covered by a FILM.



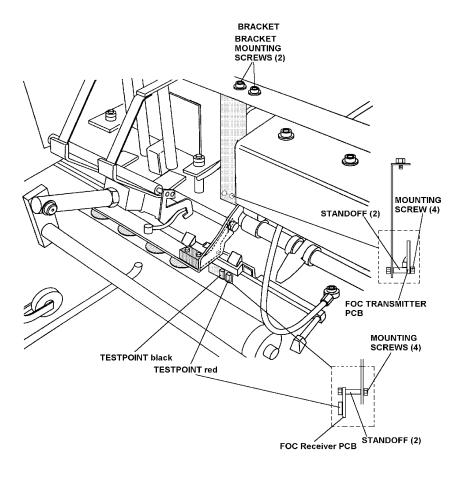
Important

The position of the FOC TRANSMITTER must not change after the adjustment is done. The output of this SENSOR is most sensitive to position changes. Ensure that the SENSOR is not touched by the EXIT DOOR.

- 1. Connect the DVM to the RECEIVER TEST POINTS (red and black).
- 2. Change the position of the TRANSMITTER PCB until the voltage is below 500 mV. As the light distribution of the TRANSMITTER is not even across the illuminated area, it might be necessary to tilt the TRANSMITTER PCB sideways a small amount. If it is still not possible to achieve a voltage < 500 mV, then record the lowest voltage and proceed with step 3, or else proceed with step 6.
- 3. Connect the GROUND LEAD of the DVM to TP 2 of PCB A9. Connect the positive lead to the upper wire of RESISTOR R9 PCB A9. See figure 4-55.
- 4. Adjust R27 until the voltage is the minimum value reached in step 2 + 400 mV.
- 5. Connect the DVM to the RECEIVER TEST POINTS (red and black).

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6. Interrupt the light path with a fresh FILM. The voltage must now be higher than 1.5 V, or 400 mV higher than the voltage reached in step 4.



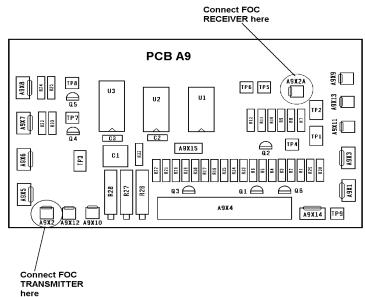


figure 4-55

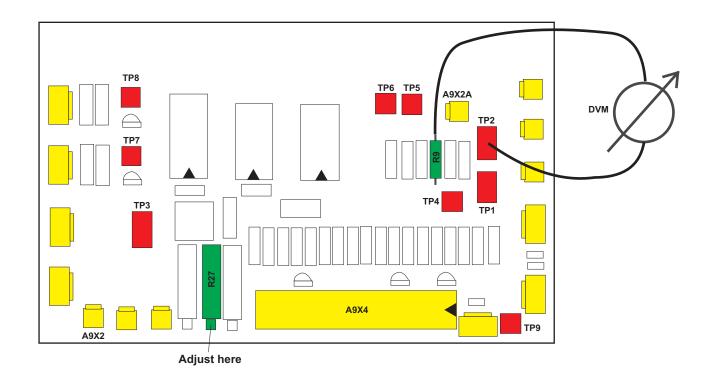


figure 4-56

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FILM OUT OF CASSETTE SENSOR B6 (FOC) ML700 only (new style version PN 9284356)

PURPOSE:

To set the sensitivity of the SENSOR to give correct output when it is covered by a FILM.

Note

For details see the 2 drawings on the next page.

- 1. Actuate the INTERLOCK OVERRIDE SWITCH.
- 2. Switch on the ML700.
- 3. Take out the 7 MAGAZINES to avoid fogging fresh FILMS.
- **4**. Connect the DVM with the GROUND LEAD to TP 2 of PCB A9. Connect the POSITIVE LEAD to the upper wire of RESISTOR R9 on PCB A9.
- **5**. Adjust R27 until the voltage is $2.5 \pm 0.5 \text{ V}$.
- 6. Loosen the MOUNTING SCREWS(2) of SENSOR FOC.
- 7. Turn the GAIN ADJUSTMENT SCREW of SENSOR FOC fully cw to get maximum gain.
- 8. Put a sheet of white paper onto the CASSETTE BELT.
- **9**. Carefully pivot the new SENSOR FOC in the indicated direction until its INDICATOR LED turns green. This is caused by the reflection of the infrared beam at the WHITE PAPER.
- **10.** Carefully pivot the lower end of SENSOR FOC in direction of the EXIT DOOR until the INDICATOR LED is off. The infrared beam is no longer reflected back to the SENSOR.
- 11. Fasten the MOUNTING SCREWS(2).
- **12.** Push the FOC MOUNTING BRACKET approx. 1 mm to all directions to simulate movements during operation. The INDICATOR LED must not turn red or green.
- **13.** Interrupt the INFRARED BEAM with a piece of FILM. The beam is reflected back to SENSOR FOC. The INDICATOR LED must turn green.
- 14. Remove the sheet of white paper.

- 15. Feed several loaded CASSETTES into the ML700 and unload them.
- **16.** Observe that the FILM is released from the CASSETTE SUCKERS after it reached the nip of the TRANSPORT ROLLERS in the CONVEYER.
 - If the FILM is released too early increase the value of PARAMETER VACUUM OFF TIMF
 - If the FILM is released too late decrease the value of PARAMETER VACUUM OFF TIME.
- 17. Place a self adhesive tape onto the INDICATOR LED to avoid fogging FILMS.
- 18. Run several cycles with different cassette sizes to ensure proper operation.
- 19. Enable the INTERLOCK OVERRIDE SWITCH and mount all PANELS.

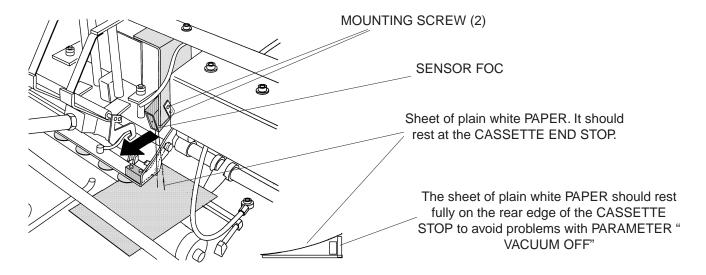


figure 4-57

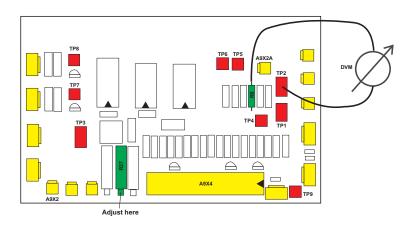


figure 4-58

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FILM OUT OF CASSETTE SENSOR B6 (FOC) ML700 Plus only

PURPOSE:

This adjustment ensures that the CASSETTE FILM is detected after it is picked up by the CASSETTE SUCKER BAR.

- 1. Open the ML700 Plus FRONT DOOR and take out the 7 MAGAZINES to avoid fogging of fresh FILMS.
- 2. Open the ML700 Plus TOP COVER and manually open the EXIT DOOR.
- 3. Loosen the MOUNTING SCREWS (2) of SENSOR B6 (FOC).

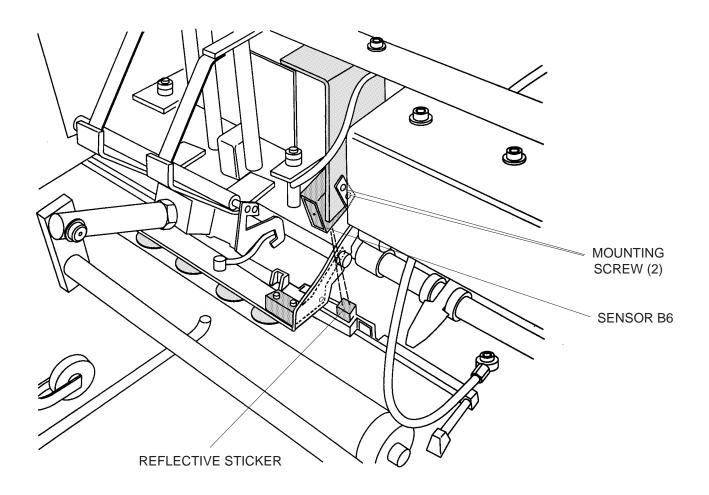


figure 4-59

4. Turn the GAIN ADJUSTMENT SCREW of SENSOR B6 fully cw to get maximum gain.

 Carefully pivot SENSOR B6 in the indicated direction until its indicator LED turns green. This is caused by the reflection of the infrared beam at the REFLECTIVE STICKER.

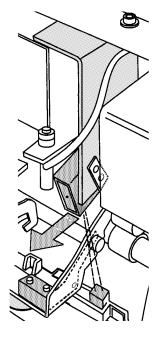


figure 4-60

- **6**. Carefully pivot the lower end of SENSOR B6 in direction of the EXIT DOOR until the INDICATOR LED is OFF. The infrared beam is no longer reflected back to the SENSOR.
- 7. Fasten the SENSOR MOUNTING SCREWS (2).
- **8**. Hold a piece of FILM into the INFRARED BEAM. The beam is reflected back to the SENSOR. The INDICATOR LED must turn green.
- **9**. Actuate the TOP COVER INTERLOCK.
- 10. Feed several loaded CASSETTES into the ML700 Plus and unload them.
- **11.** Observe that the FILM is released from the CASSETTE SUCKERS after it reached the nip of the TRANSPORT ROLLERS in the CONVEYER.
 - If the FILM is released too early increase the value of PARAMETER VACUUM OFF TIME.
 - If the FILM is released too late decrease the value of PARAMETER VACUUM OFF TIME.
- 12. Close the TOP COVER and insert the MAGAZINES.
- **13.** Run several cycles with various cassette sizes to ensure proper operation.

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FILM POCKET ADJUSTMENT

PARALLELISM OF THE FILM POCKET DRIVE SHAFT.

SPECIAL TOOLS:

VERNIER CALLIPER

PURPOSE:

This adjustment makes sure that the FILM POCKET DRIVE SHAFT is parallel to the MAGAZINE.

Note

Do this adjustment, while the ML700 is turned off.

- 1. Insert a MAGAZINE into position 4.
- 2. Move FILM POCKET to MAGAZINE 4.
- Measure with a VERNIER CALLIPER the distance between :
 A to MAGAZINE REAR WALL and B to the MAGAZINE REAR WALL.

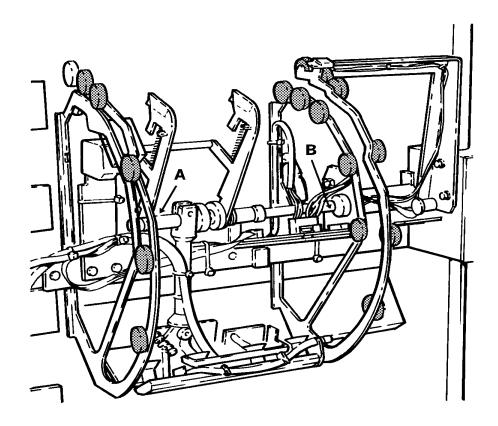


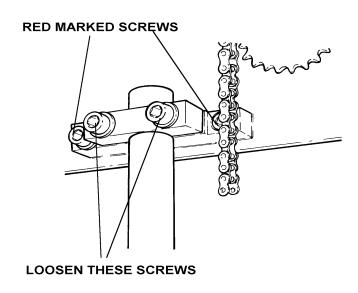
figure 4-61



Caution

DO NOT LOOSEN THE RED MARKED SCREWS. THESE ARE FACTORY ADJUSTMENTS.

4. If the values are not identical loosen the indicated ALLEN SCREWS.



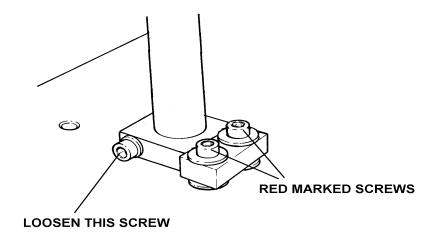


figure 4-62

- **5**. Turn the FILM POCKET DRIVE SHAFT in or out until distances A and B are the same.
- **6**. Carefully tighten the ALLEN SCREWS.
- 7. Repeat the measurement. If the values have changed start again with step 4.

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POSITION OF MAGAZINE SUCKER BAR.

SPECIAL TOOLS:

DENTIST MIRROR TL2753



Do the ADJUSTMENT of FILM POCKET TIMING DISKS after this one is altered.

PURPOSE:

This adjustment makes sure that the BLOWPIPES go into the RECESSES of the MAGAZINE and that the SENSOR MAE(B16) is interrupted by the MAGAZINE PIN.

- 1. Switch off ML 700.
- 2. Remove the LID of an empty MAGAZINE, load a film with a REFERENCE LINE 3 mm away from the LEADING EDGE into the MAGAZINE. Insert the MAGAZINE into LEVEL 7.
- 3. Move FILM POCKET by hand to level 7.
- 4. Rotate the SUCKER BAR ARM into an upright (vertical) position.
- **5**. Loosen SCREW 3.

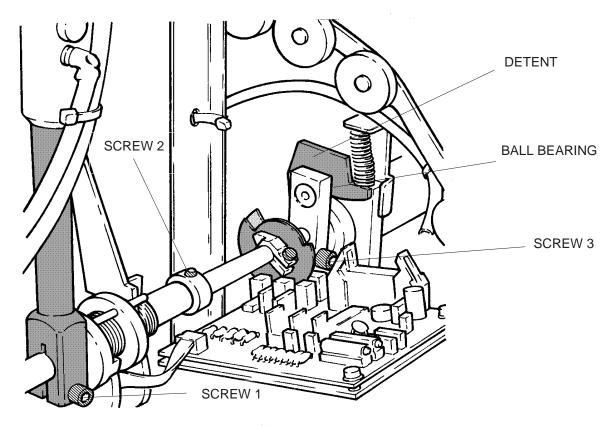


figure 4-63

6. Engage the BALL BEARING in the DETENT. See the drawing on the previous page.

- 7. Move the FILM POCKET carefully down.
- **8**. Check that the MAGAZINE PIN is in the centre of SENSOR MAGAZINE ALMOST EMPTY B16(MAE). if there is an offset sideways loosen SCREWS 1 and 2 (see the drawing on the previous page) to move the MAGAZINE SUCKER BAR to the correct position.

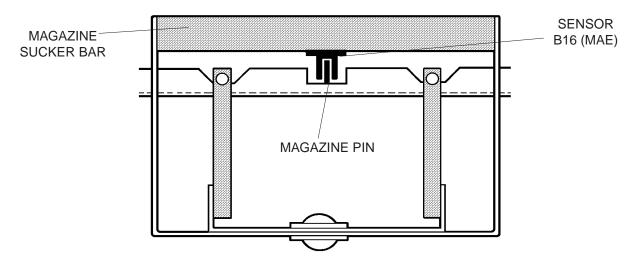
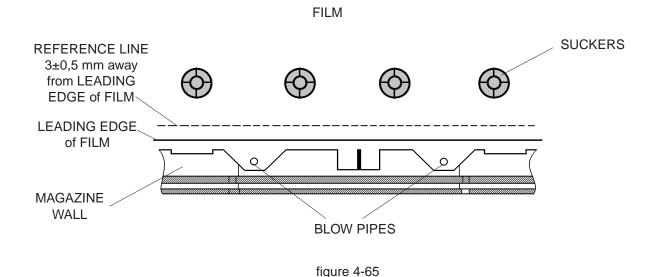


figure 4-64

9. Check that the BLOWPIPES are in the MAGAZINE RECESSES. The BLOWPIPES must not touch the MAGAZINE WALL and they must not reach into the FILM AREA. Pivot the MAGAZINE SUCKER BAR and check that the SUCKERS are at the REFERENCE LINE on the FILM. If they are away from the line, loosen SCREW 1 and move the SUCKER BAR ARM in or out as required.

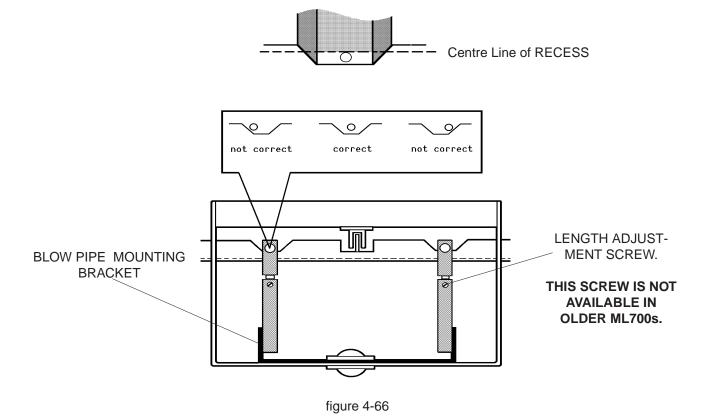


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Note

It is most important that this SCREW is tightened. If not tight, the relationship between the two FILM POCKET TIMING DISKS and the MAGAZINE SUCKER BAR will be lost. It is then impossible to pick up a FILM from the MAGAZINE.

- 10. Tighten SCREW 1.
- 11. Move the COLLAR with SCREW 2 all the way to the left and tighten the SCREW.
- 12. Tighten SCREW 3.
- **13**. If there is an offset sideways between BLOWPIPES and the MAGAZINE RECESSES do the following:
 - Bend the BLOWPIPE MOUNTING BRACKET carefully to left or right as required.
 - The BLOW PIPES must not be in the shaded areas. On newer ML700 and on ML700 Plus the BLOW PIPES can be moved forward or backward after the LENGTH ADJUSTMENT SCREW is made loose. After the BLOW PIPES are set to the correct position, do not over tighten the LENGTH ADJUSTMENT SCREWS, otherwise they dig into the BLOW PIPES and a fine adjustment is no longer possible.



14. Insert the MAGAZINE into LEVEL 1 and check the adjustment again. Use a DENTIST MIRROR.

- 15. If necessary do the corrections.
- 16. Feed a CRT CASSETTE into the MULTILOADER and open it.
- 17. Move the FILM POCKET to the CASSETTE LEVEL.
- 18. Rotate the MAGAZINE SUCKER BAR to the MSI POSITION

Note

This adjustment is especially critical when X-OMATIC CASSETTES and VIDEO FILM HOLDERS are used, because there is a difference of 5 mm in the LIGHT LOCK POSITION in relation to the METAL EDGE of the CASSETTES.

19. Check that the MAGAZINE BLOW PIPES are in the area of the CASSETTE LIGHT LOCK.

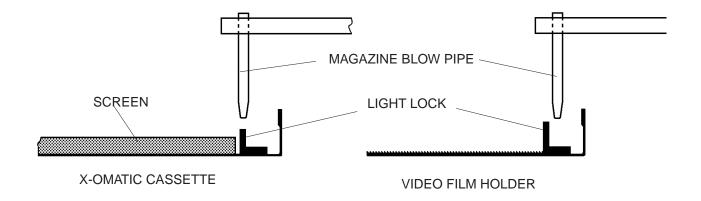


figure 4-67

- **20.** If the position is not correct, loosen SCREW 1 (fig 4-63) and the LOCK NUT from the MAGAZINE SUCKER BAR ARM and move it in or out as required.
- 21. Fasten SCREW 1 and the LOCK NUT.
- 22. Check that SENSOR B16 (Magazine Almost Empty) is still working.

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23. Check that the MAGAZINE BLOW PIPES are still in the correct position in the MAGAZINE.

ADJUSTMENT OF FILM POCKET TIMING DISKS

PURPOSE:

This adjustment gives the correct TRANSPORT POSITION (TP) and MAGAZINE SUCKER BAR IN POSITION (MSI). TRANSPORT POSITION 1 is set automatically when MAGAZINE SUCKER BAR IN POSITION is adjusted.

Note

Before doing this procedure the ADJUSTMENT POSITION OF MAGAZINE SUCKER BAR section has to be correct.

MAGAZINE SUCKER BAR IN POSITION

- 1. Start the SENSOR TEST.
- 2. Rotate the SUCKER BAR ARM into an upright (vertical) position.
- 3. Make sure that the BALL BEARING is engaged in the DETENT.

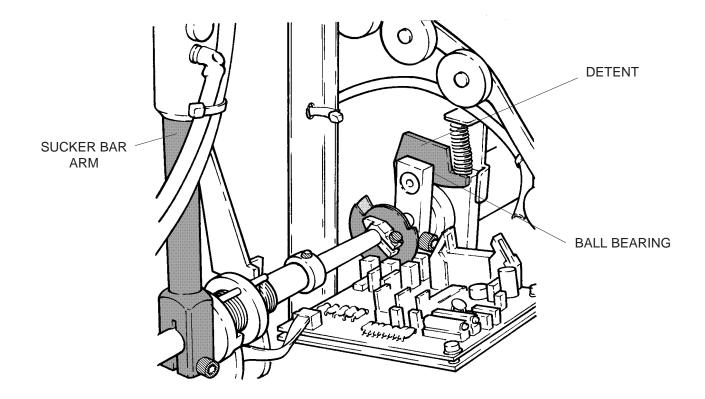


figure 4-68

4. Loosen the SETSCREW of the LEFT HAND TIMING DISK.

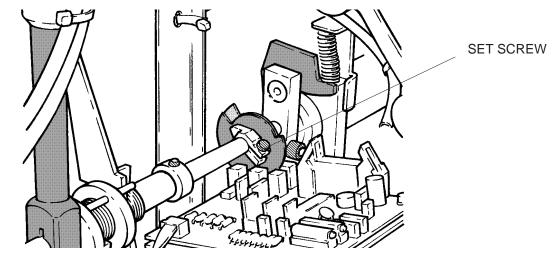


figure 4-69

5. Rotate the LEFT HAND TIMING DISK until SENSOR MAGAZINE SUCKER BAR IN B11 (MSI) becomes interrupted. This is indicated by a BEEP from the SENSOR TEST.

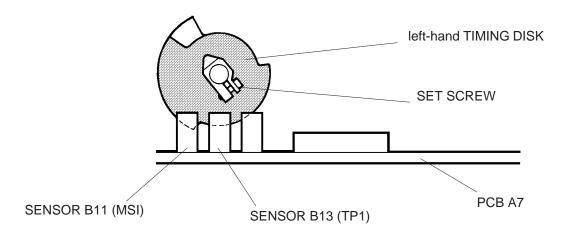


figure 4-70

- **6**. TIGHTEN the SETSCREW. See figure 90.
- 7. Leave the SERVICE MODE.
- **8**. Key in 3585 to bring all MOTORS to their HOME POSITION.
- 9. Run several TEST CYCLES.

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TRANSPORT POSITION TP

- 1. Start SENSOR TEST.
- 2. Rotate the SUCKER BAR ARM down to a vertical position (6 o'clock position).

3. Open the SETSCREW of the RIGHT HAND TIMING DISK.

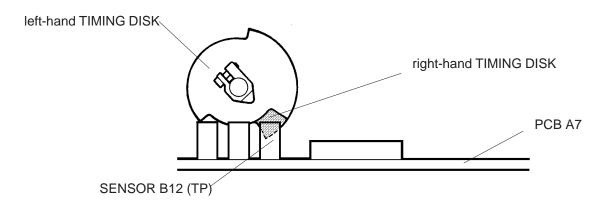


figure 4-71

- **4**. Rotate the RIGHT HAND TIMING DISK until SENSOR TRANSPORT POSITION B12 (TP) becomes interrupted. This is indicated by a BEEP from the SENSOR TEST.
- **5**. Tighten the SETSCREW.
- 6. Leave the SERVICE MODE.
- 7. Key in 3585 to bring all MOTORS to their HOME POSITION.
- **8**. Run several TEST CYCLES.

FILM REJECTER BRACKET

PURPOSE:

This adjustment makes sure that the FILM REJECTER BRACKET is not interfering with the MAGAZINES and the FRAME when the FILM POCKET moves up or down and that the INFRARED LIGHT BEAM of SENSOR MAGAZINE BLOCKED BY FILM B30 (MBF) is not interrupted.

- 1. Rotate the MAGAZINE SUCKER BAR into TRANSPORT POSITION.
- 2. Loosen the indicated SCREWS.

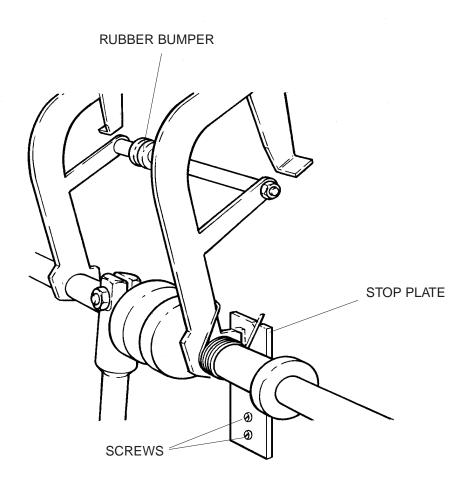


figure 4-72

- **3**. Move the STOP PLATE up or down, until the horizontal BAR of the FILM REJECTER BRACKET with the RUBBER BUMPER is behind the MOUNTING BRACKET of the MAGAZINE EMPTY SENSOR.
- 4. Tighten the SCREW.

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MAGAZINE EMPTY SENSOR

PURPOSE:

This adjustment makes sure that a MAGAZINE is recognised as being empty after the last FILM is removed.

- 1. Insert an empty MAGAZINE into position 4.
- 2. Enter SERVICE MODE.
 - Select OPTION 7.8.1 (FILM POCKET) and transport the FILM POCKET to LEVEL 4.
 - Select OPTION 7.6 (OPEN CLOSE MAGAZINE).
 - Select MAGAZINE 4 and open it.
- 3. Rotate the MAGAZINE SUCKER BAR fully in.
- 4. Look across the SENSOR MAGAZINE EMPTY B10 (ME), to the MIRROR and then to the REFLECTIVE STICKER in the MAGAZINE.

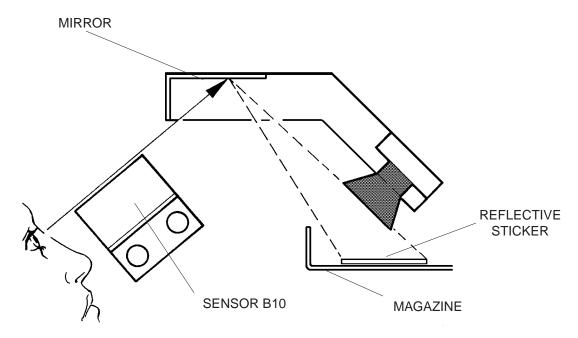


figure 4-73

- 5. If the REFLECTIVE STICKER is not visible open the MOUNTING SCREWS of SENSOR B10 (ME) and move it up or down until the REFLECTIVE STICKER becomes visible. If necessary adjust the position of the MIRROR.
- **6**. Tighten the SCREWS.

Note

Do not set the gain too high. It might be possible that the INFRARED LIGHT BEAM is reflected by FILM in a MAGAZINE triggering the SENSOR and recognising the MAGAZINE as being empty.

7. Rotate the GAIN ADJUSTMENT SCREW of SENSOR B10 (ME) count counter until the indicator LED turns red. Now turn the GAIN ADJUSTMENT SCREW 1 step clockwise so that the INDICATOR LED turns green.

Note

The green SENSOR LED will be turned on in MAGAZINE LEVEL 1 if the FILM POCKET SUCKER BAR is not rotated fully in. The SENSOR will see INFRARED LIGHT reflected from the MBF REFLECTIVE STICKER at this time. This is no fault. The signal of SENSOR B10 (ME) is only valid if the FILM POCKET SUCKER BAR is in the MSI POSITION.

- **8**. Check this adjustment in MAGAZINE LEVEL 1. It is possible that the INFRAFRED BEAM will be reflected by the REFLECTOR for SENSOR MAGAZINE BLOCKED BY FILM. If this occurs readjust the position of the MIRROR and the SENSOR B10 (ME).
- 9. Leave the SERVICE MODE.
- 10. Key in 3585 to bring all MOTORS to HOME POSITION.

FILM POCKET STEPPER MOTOR M8

PURPOSE:

To set the current of the FILM POCKET STEPPER MOTOR M8 to the correct value.

- 1. Enter the SERVICE MODE.
- 2. Key in 7, 8, 1, 2, (Move FILM POCKET to LEVEL 2).
- 3. Connect the DVM to TP1 and R22 on PCB A3. See the top drawing on the next page.
- **4**. Key in 3 to move the FILM POCKET to the HOME POSITION. During the movement of the STEPPER MOTOR the DVM reading has to be 1.64 to 1.67V. If not adjust R23.

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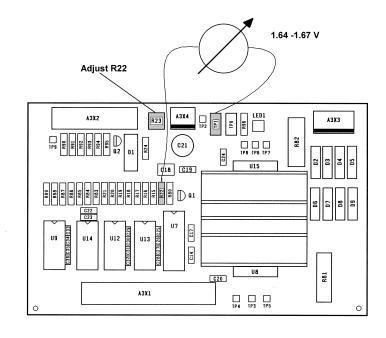


figure 4-74

FILM POCKET STEPPER MOTOR SPROCKET

- 1. Move the SPROCKET to a clearance of 2.5mm between SPROCKET and FRAME.
- 2. Check that the clearance between SAFETY SCREW and SPROCKET SHAFT is smaller than the CHAIN width. Adjust it with the quantity of WASHERS.

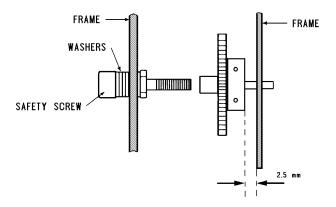


figure 4-75

FILM POCKET CHAIN LENGTH

PURPOSE:

If the CHAIN is too short, it is impossible to take out all FILMS from a MAGAZINE #7. If the CHAIN is too long, the COUNTERWEIGHT will rest on the BASE before the FILM POCKET reaches the CASSETTE LEVEL.

1. Loosen NUTS.

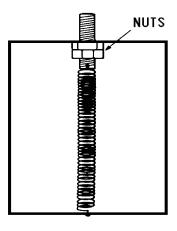


figure 4-76

- 2. To make the CHAIN shorter rotate NUTS clockwise.
- 3. To make the CHAIN longer rotate NUTS counterclockwise.
- **4**. Check that the COUNTERWEIGHT does not touch the bottom or top of the FRAME when the FILM POCKET is at the CASSETTE LEVEL or the MAGAZINE SUCKER BAR moves into MAGAZINE 7 when this MAGAZINE is empty.
- **5**. Tighten NUTS.

FILM POCKET REFERENCE POSITION

PURPOSE:

To set the REFERENCE BRACKETS to the correct MAGAZINE Positions (1...7) and CASSETTE Position, to make the MAGAZINE SUCKER BAR moves freely into CASSETTE and MAGAZINES.

- 1. Disconnect the power from ML 700.
- 2. Move SERVICE SWITCH on PCB A0 to the right.

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- 3. Disconnect STEPPER MOTOR M8.
- **4**. Take out all MAGAZINES and insert an empty MAGAZINE into the selected TEST LOCATION.
- 5. Loosen the REFERENCE BRACKET for the TEST MAGAZINE.
- **6**. Connect the power to the ML 700.
- 7. Go to SERVICE MODE .FDAB ,Day,Day,9,9
- 8. Move SERVICE SWITCH on PCB A0 to the left.
- 9. Open the selected TEST MAGAZINE and start the SENSOR TEST.
- **10**. Move the FILM POCKET carefully down until the FILM POCKET SUCKER BAR can be moved freely into the opened MAGAZINE.
- **11**. Move the REFERENCE BRACKET slowly down, until the SENSOR TEST indicates that the REFERENCE POSITION PHOTOCELL RP (B15) is covered.

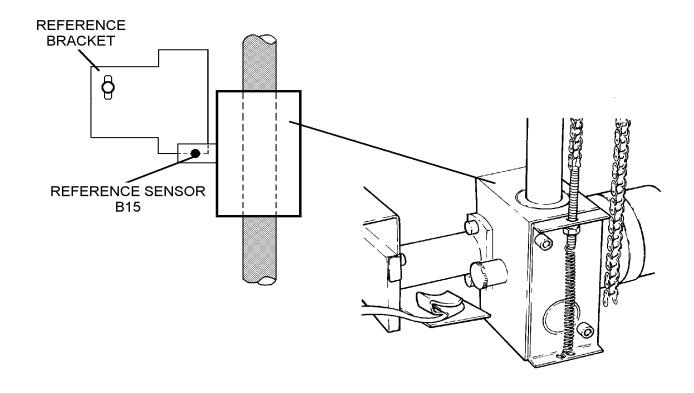


figure 4-77

- 12. Fasten the REFERENCE BRACKET.
- 13. Repeat Step 10 to 13 for the remaining MAGAZINE positions if necessary.

14. Feed a CASSETTE into the ML700 and open it.

Note

This is especially important for VIDEO FILM HOLDERS because the LIGHT LOCK is approx. 1.5mm higher than on X-OMATIC CASSETTES. The amount of STEPS for the CASSETTE REFERENCE POSITION has to be below 300. Normally it is in the range of 260 to 280.

- **15**. Move the FILM POCKET carefully up to the CASSETTE LEVEL, until the FILM POCKET SUCKER BAR can be moved freely into the opened CASSETTE.
- **16**. Repeat step 11 to 13.
- 17. Leave SERVICE MODE.
- 18. Power down the ML 700.
- 19. Connect STEPPER MOTOR.
- **20**. Power up the ML 700.
- **21**. Go to SERVICE MODE FDAB, Day, Day, 9, 9.
 - Select Option 2 (Change Parameters) .
 - Start NEW (key #2). The ML700 calculates now the steps of the various REFERENCE POSITION.
 - Leave SERVICE MODE.
- **22.** Operate the ML700 to take FILM from all MAGAZINES whose REFERENCE BRACKET position was changed.

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DOUBLE FILM SENSOR B14 (DFS)

ML700 UP TO SN 1022

1. Connect negative lead of DVM to TP1 on PCB A7.

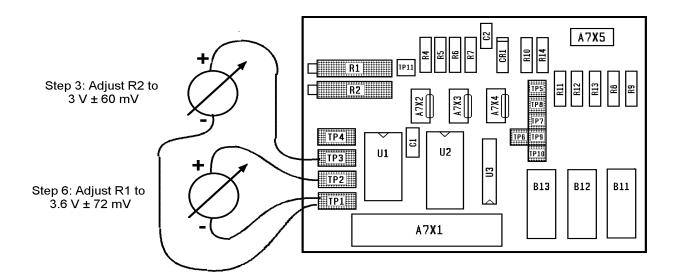


figure 4-78

- 2. Connect positive lead of DVM to TP3 on PCB A7.
- **3**. Adjust R2 to 3 V \pm 60 mV .
- 4. Connect positive lead of DVM to TP2 on PCB A7.
- **5**. Cover SENSOR B14 with DENSITY TOOL PN 9191223 (ND 1.5 WRATTEN FILTER #96).
- **6**. Adjust R1 to 3.6 V \pm 72 mV.

ML700 from SN 1023 AND HIGHER AND ALL 60Hz UNITS

1. Connect negative lead of DVM to TP1 of PCB A7.

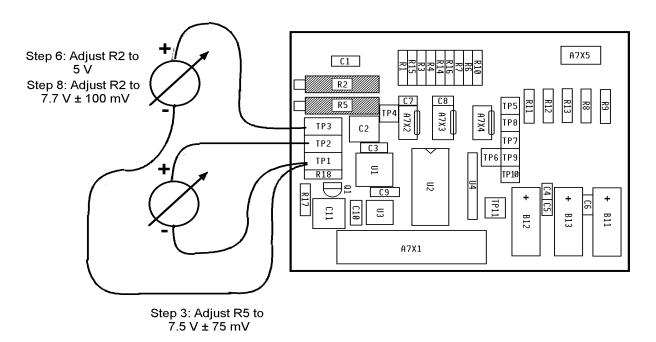


figure 4-79

- 2. Connect positive lead of DVM to TP 2 of PCB A7.
- **3**. Adjust R5 on PCB A7 to $7.5V \pm 75$ mV.
- 4. Connect positive lead of DVM to TP 3 of PCB A7.
- **5**. Cover SENSOR B14 with DENSITY TOOL PN 9191223 (ND 1.5 WRATTEN FILTER #96)
- 6. Adjust R2 on PCB A7 to 5V.
- 7. Adjust the mechanical position of the DOUBLE FILM SENSOR until the DVM shows the highest reading.
- **8**. Adjust R2 on PCB A7 to 7.7 V \pm 0.1V .
- 9. Test with fresh CUSTOMER FILMS (Single and double).

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DOUBLE FILM SENSOR B14 (DFS) ML700 Plus

PURPOSE:

To ensure that only 1 FILM is picked up from the MAGAZINE.

FUNCTIONAL DESCRIPTION:

The fresh FILM picked up from the MAGAZINE goes in between the 2 DETECTOR ROLLERS of the DOUBLE FILM SENSOR. The DETECTOR ROLLERS become separated by the FILM. This causes the arm of the DOUBLE FILM SENSOR to move through PHOTO SENSOR DFS B14. The end of this arm is slotted. If there is just 1 FILM between the DETECTOR ROLLERS the IR light from the SENSOR TRANSMITTER will pass through the slot. If there are more than 1 FILM or no FILM or the CARDBOARD from the FILM BOX between the DETECTOR ROLLERS, the slot will be at a different position and no IR light can pass through the solid part of the DETECTOR ARM. Up to 3 attempts will be made to pick up 1 FILM from the MAGAZINE. If attempt 3 is still unsuccessful the cycle will be aborted and a ERROR MESSAGE is displayed.

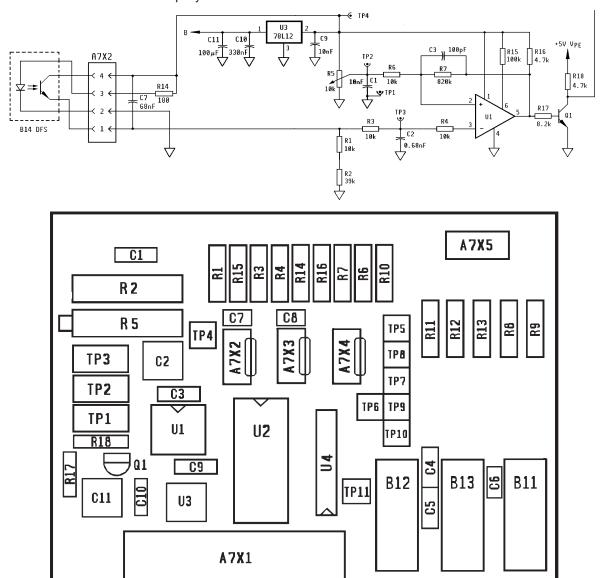


figure 4-80



Warning

Mind your head when working behind the ML700 Plus. The TUNNEL has hard corners.

1. Separate the ML700 from the PROCESSOR (or from the SIDE-BY-SIDE SYSTEM).

- 2. Take off the REAR PANEL.
- **3**. Enter the SERVICE MODE. FDAB,day,day. This ensures that no MOTOR is started accidentally.
- 4. Connect the DVM between TP1 (GNDPE) and TP2 of PCB A7 FILM POCKET and adjust R5 to 6 V +/- 0.5 V. Connect the DVM between TP1 (GNDPE) and TP3 of PCB A7.
- 5. Loosen both MOUNTING SCREWS of the DOUBLE FILM SENSOR B14. See the drawing on the next page.
- 6. Place 1 piece of film between the 2 DETECTOR ROLLERS.



Caution

The DOUBLE FILM ADJUSTMENT SCREW must not be turned without loosening the MOUNTING SCREWS first.

- 7. Turn the DOUBLE FILM ADJUSTMENT SCREW (both MOUNTING SCREWS of SENSOR B14 must be loose) until the DVM reads the maximum voltage. The voltage at TEST POINT 3 should reach +11 to +12 VDC. If the voltage is correct proceed with step 8 otherwise proceed with step 6.
- 8. Fasten the MOUNTING SCREWS of SENSOR B14.
- **9**. Place 2 FILMS between the DOUBLE FILM DETECTOR ROLLERS. The voltage between TP3 and TP1 should now be <4 VDC. If the voltage is not < 4 VDC the slot in the DETECTOR ARM is not centred correctly in the PHOTOCELL B14. In this case go back to step 5.
- **10.** While the 2 FILMS are still between the 2 DOUBLE FILM DETECTOR ROLLERS move them sideways. The voltage should still be < 4 VDC. If the voltage is higher go back to STEP 5. If the voltage is not < 4 VDC the slot in the DETECTOR ARM is not centred correctly in the PHOTOCELL B14.
- **11.** Take out both FILMS from the DOUBLE FILM DETECTOR ROLLERS. The voltage between TP3 and TP1 should now be <4 VDC. If the voltage is higher go back to STEP 5. If the voltage is not < 4 VDC the slot in the DETECTOR ARM is not centred correctly in the PHOTOCELL B14.

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The ADJUSTMENT SCREW must not be turned while the SENSOR MOUNTING SCREWS are tight.

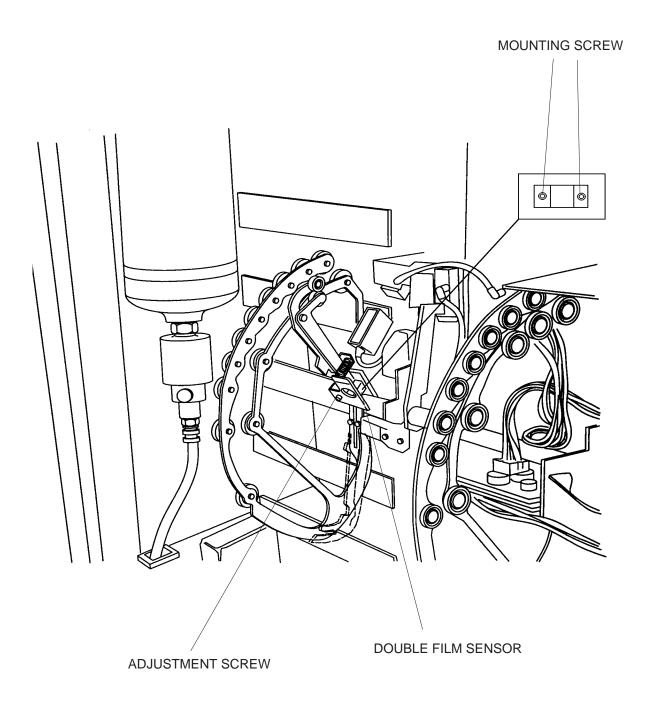


figure 4-81

12. Ensure that the DOUBLE FILM DETECTOR is enabled in the CHANGE PARAMETER MENU.

PRESS 2 (CHANGE PARAMETER)

Press 8 twice

Press 3 (DOUBLE SHEET DET.)

Press 1 this enables the double film detector

Press 7 (ENABLE OPERATION)

Press 1

Press 8 twice

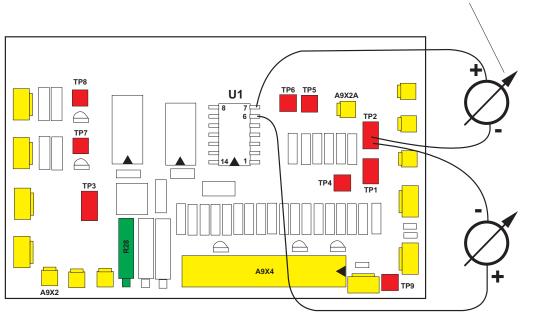
- **13.** Mount the REAR PANEL and fix the ML700 to the PROCESSOR (or SIDE-BY-SIDE SYSTEM).
- 14. Run a few cycles with various cassette sizes to ensure proper operation.

TUNNEL SENSOR REAR B7 (TSR)

PURPOSE:

To set the sensitivity of the SENSOR ,to make it give correct output when it is covered by a FILM.

1. Connect positive lead of DVM to Pin 7 of U1 on PCB A9. Connect negative lead of DVM to TP2 of PCB A9.



Step 2. Without a FILM the voltage should be ≦ +0.4 V

Step 4. Adjust R28 to + 1.0 V

figure 4-82

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2. Without a film the voltage reading should be ≤+0.4 V. If the voltage is higher readjust the mechanical Position of B7.

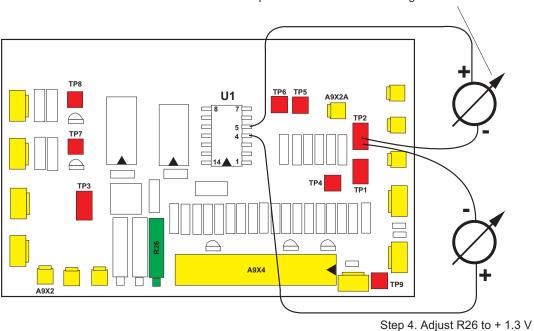
- 3. Connect positive lead of DVM to Pin 6 of U1 on PCB A9.
- 4. Adjust R28 on PCB A9 to +1.0 V.

TUNNEL SENSOR FRONT B8 (TSF)

PURPOSE:

To set the sensitivity of the SENSOR to make it give correct output when it is covered by a FILM.

1. Connect positive lead of DVM to Pin 5 U1 on PCB A9. Connect negative lead of DVM to TP2 of PCB A9.



Step 2. Without a FILM the voltage should be ≤ +0.4 V

figure 4-83

- **2**. Without a film the voltage reading should be ≤+0.4 V. If the voltage is higher readjust the mechanical Position of B8.
- 3. Connect positive lead of DVM to Pin 4 of U1 on PCB A9.
- **4**. Adjust R26 on PCB A9 to + 1.3 V.

TUNNEL SENSOR TSF / TSR (ML700 only) REPAIR KIT 9194426

PURPOSE:

The original TUNNEL SENSOR 9188606 is no longer available. It is replaced with REPAIR KIT 9194426.

1. Connect the DVM to the RECEIVER TEST POINTS (red and black).

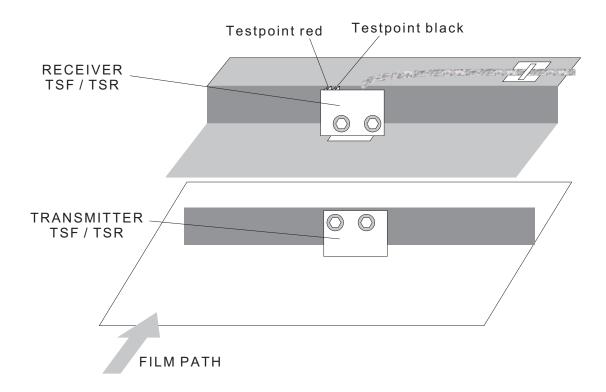


figure 4-84

- 2. Change the position of the RECEIVER PCB until the voltage is below 500 mV.
- 3. Interrupt the light path with a fresh FILM. The voltage must now be higher than 1.5 V. It might be necessary to change the position of the TRANSMITTER PCB if the correct voltage cannot be reached.

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PNEUMATIC SYSTEM CASSETTE

A. VACUUM PUMP CASSETTE

PURPOSE:

The vacuum has to be in the correct range. If the vacuum is too low, a FILM might not be picked up in the CASSETTE. If the vacuum is too high a FILM might not be separated from the CASSETTE SCREEN.

1. Connect VACUUM GAUGE PN 29010170.

Connect the VACUUM GAUGE here

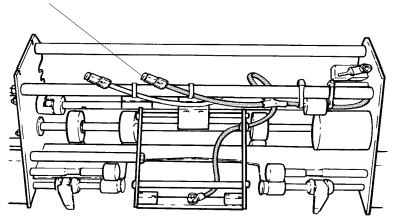


figure 4-85

2. Loosen LOCKNUT at VACUUM PUMP.

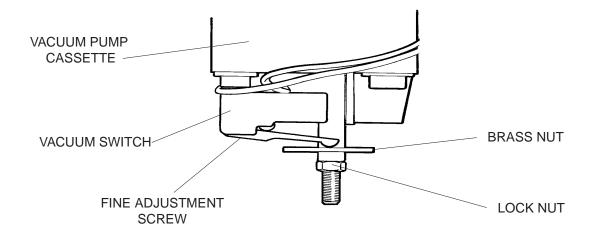


figure 4-86

- 3. Enter SERVICE MODE FDAB, Day, Day, 9,9.
 - Select Option 7.8.2 (VACUUM PUMPS).
 - Select Option 7.8.3 (CASSETTE SUCKING).
- 4. Cover CASSETTE SUCKERS with a FILM.
- 5. Adjust the Vacuum to -400 mBar -30 mBar with the BRASS NUT.
- 6. Tighten LOCKNUT.
- 7. Readjust if necessary with FINE ADJUSTMENT SCREW of VACUUM SWITCH.
- 8. Switch off VACUUM PUMP and deenergize SOLENOID VALVE.
- 9. Leave Service Mode.
- **10**. Key in 3585 to bring all MOTORS to HOME POSITION.

B. AIR PRESSURE OF CASSETTE BLOWING

PURPOSE:

Through the CASSETTE BLOWPIPES air is blown into the CASSETTE to separate a FILM from the CASSETTE LID.



DURING THIS ADJUSTMENT THE AIR RESERVOIR WILL BE EMPTY AFTER A FEW SECONDS. IN THIS CASE DEENERGIZE THE SOLENOID VALVE AND WAIT UNTIL THE COMPRESSOR STOPS. THEN ENERGISE THE SOLENOID VALVE AGAIN.

- 1. Connect PRESSURE GAUGE PN 9186781.
- 2. Enter SERVICE MODE FDAB ,Day,Day,9,9.
 - Select Option 7.3 (CASSETTE BLOWING).

Note

Check that the BLOWPIPES are not clogged.

- **3**. Adjust REGULATOR for 2 Bar 30mBar. See the drawing on the next page.
- 4. Deenergize the SOLENOID VALVE "CASSETTE BLOWING".
- 5. Leave SERVICE MODE.

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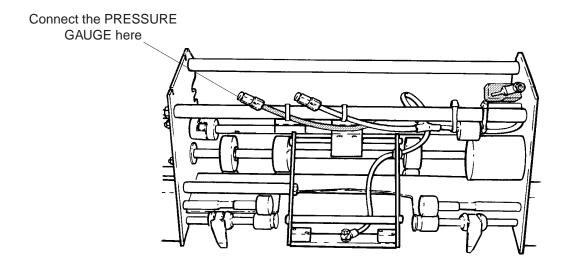


figure 4-87

6. Key in 3585 to bring all motors to HOME POSITION.

PNEUMATIC SYSTEM FILM POCKET

A. VACUUM PUMP FOR FILM POCKET

PURPOSE:

The vacuum has to be in the correct range. If the vacuum is too low a FILM might not be picked up in the MAGAZINE. If the vacuum is too high more than one FILM might be picked up from the MAGAZINE.

1. Connect VACUUM GAUGE.

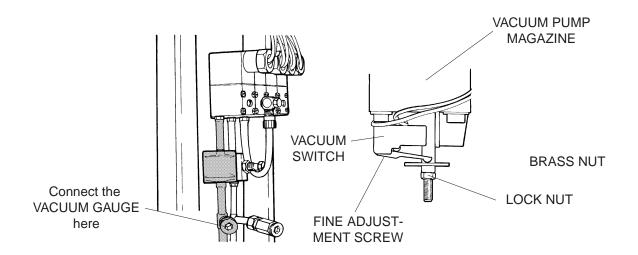


figure 4-88

- 2. Loosen LOCKNUT at VACUUM PUMP.
- **3**. Enter SERVICE MODE FDAB ,Day,Day,9,9.
 - Select Option 7.8.2 (VACUUM PUMPS).
 - Select Option 7.8.4 (MAGAZINE SUCKING).
- 4. Cover FILM POCKET SUCKERS with a sheet of FILM.
- 5. Adjust the VACUUM to -400 mBar 30 mBar with BRASS NUT.
- **6**. Tighten LOCKNUT.
- 7. Readjust if necessary with FINE ADJUSTMENT SCREW of VACUUM SWITCH.
- 8. Stop VACUUM PUMP and deenergize SOLENOID VALVE.
- 9. Leave SERVICE MODE.
- **10**. Key in 3585 to bring all MOTORS to HOME POSITION.

B. AIR PRESSURE OF FILM POCKET BLOWING

PURPOSE:

The pressure has to be in the correct range. If it is not correct, Films in the MAGAZINE may not become separated.



DURING THIS ADJUSTMENT THE AIR RESERVOIR WILL BE EMPTY AFTER A FEW SECONDS. IN THIS CASE DEENERGIZE THE SOLENOID VALVE AND WAIT UNTIL THE COMPRESSOR STOPS. THEN ENERGISE THE SOLENOID VALVE AGAIN.

- 1. Connect PRESSURE GAUGE PN 9186781. See the drawing on the next page.
- 2. Enter to SERVICE MODE FDAB ,Day,Day,9,9.
 - Select Option 7.8.4 (MAGAZINE BLOWING).
- **4**. Adjust REGULATOR for 1.8 Bar ±0.1 Bar.
- 5. Denergize the SOLENOID VALVE "MAGAZINE BLOWING".
- **6**. Leave SERVICE MODE.
- 7. Key in 3585 to bring all MOTORS to HOME POSITION

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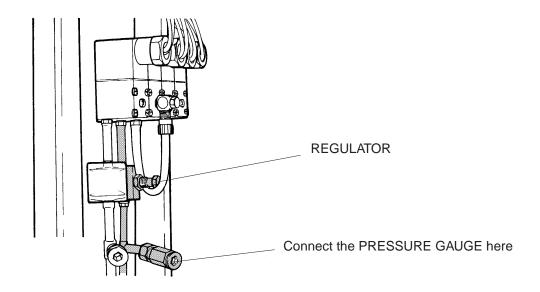


figure 4-89

ADJUSTING HUMIDIFIER PCB A16.

PURPOSE:

The HUMIDIFIER should be turned on if the relative humidity inside the ML 700 goes below 40%. The HUMIDIFIER can raise the internal humidity by approx. 20%.



Warning

Mind your head. Avoid injuries at the TUNNEL EDGES.

- 1. Separate the ML 700 from the PROCESSOR.
- 2. Take off the REAR PANEL.



Warning

BE CAREFUL. THERE ARE 220V ON THIS BOARD

3. Take of COVER of PCB A16.

4. Connect the positive LEAD of your DVM to TEST POINT TP5 and the negative LEAD to TEST POINT TP2.

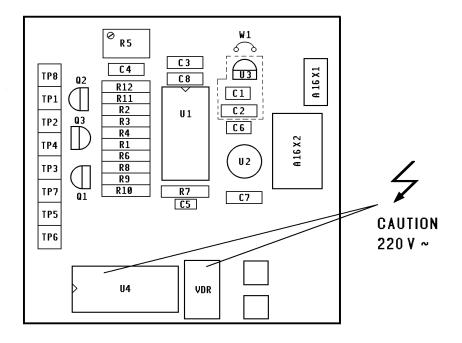


figure 4-90

- **5**. Adjust R5 to + 4.0V.
- 6. Mount COVER of PCB A16.
- 7. Mount REAR COVER.
- 8. Move ML700 to the PROCESSOR.

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CHAPTER 5

PREVENTIVE MAINTENANCE

- 1. Ask CUSTOMER if they have had any problems.
- 2. Print STATUSREPORT
- 3. Check last 60 malfunctions. If necessary check the area with problems.
- 4. Check the function of the FILM PRESENCE DETECTORS. Clean the MIRRORS.

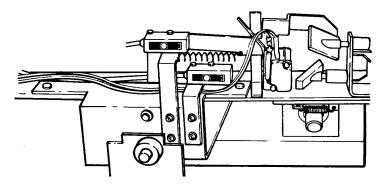


figure 5-1

- **5**. Clean the DOUBLE FILM SENSOR. Check DOUBLE FILM SENSOR adjustment. Use the correct procedure depending to the SERIAL NUMBER of MULTILOADER.
- **6**. Replace or clean AIR FILTER in the leftside DOOR (PN 9187851) and in front of the COMPRESSOR ASSY (PN 9187241).
- 7. Clean the CASSETTE TRANSPORT BELT. If necessary treat it with TALCUM POWDER to avoid bouncing of the CASSETTE after it reached S13 (CES).
- **8**. Lubricate FILM POCKET COLUMN. Turn the CAP of the GREASE BOX just 1 turn clockwise. If necessary fill the GREASE BOX with LUBRICANT TL 2345.

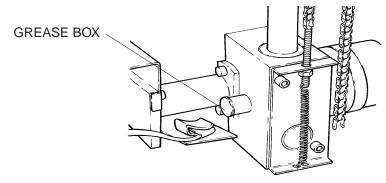
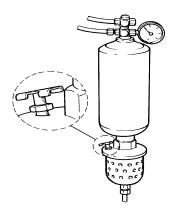


figure 5-2

- 9. Lubricate CAMS.
- 10. Lubricate FILM POCKET SPRINGS. Use only 1 drop of thin OIL.
- 11. Check PNEUMATIC SYSTEM(VACUUM and PRESSURE).
- 12. Check ROLLERS. Clean or replace them if necessary.
- **13**. Clean the horizontally mounted INFRARED SENSORS, SENSOR B6(FOC), B7(TSR), B8(TSF) they might be dusty.
- **14**. Empty WATER TRAP of AIR BOTTLE.



A00001

figure 5-3

15. Check the HUMIDIFIER. If necessary replace the FILTER CARTRIDGE PN 9198261.

- 16. Check all FUNCTIONS of ML 700.
- 17. Check REFLECTIVE STICKERS of CASSETTES. Replace them if necessary.
- 18. Every 400000 cycles, tighten the CASSETTE CENTRING CLUTCH by 1 step.
 - Take out the COUNTERSUNK SCREW.
 - Turn the CLUTCH RING 1 step clockwise and fix it again with the COUNTERSUNK SCREW.

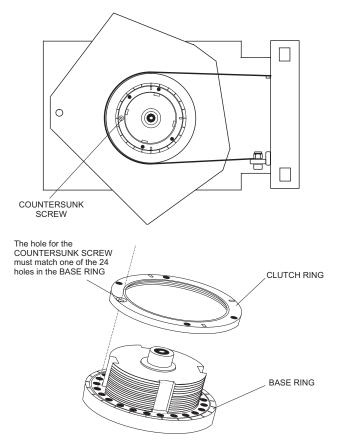


figure 5-4

CHAPTER 6

COMPONENT LOCATOR

PCB'S	
PCB A0MASTER PROCESSOR	6-1
PCB A1DISTRIBUTION	6-4
PCB A2SLAVE PROCESSOR	6-1
PCB A3POWER AMPLIFIER SLAVE PROCESSOR	6-1
PCB A4POWER AMPLIFIER	6-6
PCB A5MAGAZINE SIZE DECODER	6-4
PCB A6MAGAZINE SIZE SENSOR	6-4
PCB A7FILM POCKET	6-4
PCB A8INTERFACE(A)	6-6
PCB A9INTERFACE(B)	6-3
PCB A10FILM POCKET POSITION	6-6
PCB A11FILM SENSOR	6-4
PCB A12INTERFACE OPERATOR CONTROL	6-1
PCB A13PRINTER INTERFACE	6-1
PCB A14LIGHT BAR	6-1
PCB A15PRINTER	6-1
PCB A16HUMIDIFIER	6-4
MOTORS	
M1CASSETTE TRANSPORT6-2,	6-7
M2CASSETTE CENTERING6-2,	6-7
M3CASSETTE OPENING6-2,	6-7
M4CASSETTE UNLOADING	6-2
M5FILMTRANSPORT6-2, 6-3,	6-5
M6MAGAZINE OPENING	6-5
M7MAGAZINE FILM PICKUP6-5,	6-7
M8STEPPER MOTOR6-5,	6-7
M9COMPRESSOR	6-7
M10VACUUM PUMP MAGAZINE6-5,	6-7
M11VACUUM PUMP CASSETTE	6-7
SOLENOIDS	
L8DOOR SOLENOID TOP	6-6
L9not used	
L10 DOOR SOLENOID BOTTOM	6-6

L11MAGAZINE SOLENOID LEVEL 1	6-6
L12MAGAZINE SOLENOID LEVEL 2	6-6
L13MAGAZINE SOLENOID LEVEL 3	6-6
L14MAGAZINE SOLENOID LEVEL 4	6-6
L15MAGAZINE SOLENOID LEVEL 5	6-6
L16MAGAZINE SOLENOID LEVEL 6	6-6
L17MAGAZINE SOLENOID LEVEL 7	6-6
SOLENOID VALVES	
SV1CASSETTE VACUUM ON	6-2
SV2CASSETTE AIR ON	6-2
SV3MAGAZINE VACUUM ON	6-5
SV4MAGAZINE AIR ON	6-5
SV5WHITNEY	6-5
SV6MAGAZINE AIR INTO SUCKERS	6-5
SV7BLEEDER VALVE	6-7
SENSORS	
B1CS CASSETTE SIZE	
B2CT2 CASSETTE TYPE 2 (C1)	6-6
B2FPDB FILM PRESENCE DETECTOR BOTTOM (C3)	6-6
B3FPDT FILM PRESENCE DETECTOR TOP	
B4FPDT FILM PRESENCE DETECTOR TOP	
B5CT2 CASSETTE TYPE 2 (C3)	
B5FPDB FILM PRESENCE DETECTOR BOTTOM (C1)	
B6FOC FILM OUT OF CASSETTE	6-2
B7TSR TUNNEL SENSOR REAR	6-8
B8TSF TUNNEL SENSOR FRONT	6-8
B9MFP MAGAZINE FILMPIN	
B10ME MAGAZINE EMPTY	6-4
B11MSI MAGAZINE SUCKER BAR IN	6-4
B12TP FILM POCKET TRANSPORT POSITION	6-4
B13TP1 FILM POCKET TRANSPORT POSITION	
B14DFS DOUBLE FILM SENSOR	
B15RP REFERENCE POSITION	6-4, 6-7
B16MAE MAGAZINE ALMOST EMPTY	
B17UL UPPER LIMIT	6-7

B18LL LOWER LIMIT	6-7
B19HP HOME POSITION	6-7
B20MMO MAGAZINE MOTOR OPEN	6-4
B21MMC MAGAZINE MOTOR CLOSED	6-4
B22MC4 MAGAZINE SIZE 4	6-4
B23MC3 MAGAZINE SIZE 3	6-4
B24MC2 MAGAZINE SIZE 2	6-4
B25MC1 MAGAZINE SIZE	6-4
B26MC0 MAGAZINE SIZE 0	6-4
B27MCO MAGAZINE COVER OPEN	6-3
B28IS2 INDUCTIVE SENSOR 2	6-2
B29IS1 INDUCTIVE SENSOR	6-2
B30MBF MAGAZINE BLOCKED BY FILM	6-4
SWITCHES	
PCBA1 S1 SELECT C1/C3	6-4
S1CO CASSETTE OPEN	6-2
S2CW0 CASSETTE WIDTH 0	6-2
S3CW1 CASSETTE WIDTH	6-2
S4OC OPEN CASSETTE	6-2
S5PRU PRESSURE ROLLER UP	6-2
S6PRD PRESSURE ROLLER DOWN	6-2
S7not used	
S8PRL PRESSURE ROLLER LIFTED	6-7
S9CCO CASSETTE CENTERING OUT	6-6
S10CCI CASSETTE CENTERING IN	6-6
S11CSI CASSETTE SUCKER BAR IN	6-3
S12 CSO CASSETTE SUCKER BAR OUT	6-3
S13CES CASSETTE ENDSWITCH	6-2
S14/15CCS CASSETTE CENTERING STOP	6-3, 6-6
S16 to S19 not used	
S20TIL TUNNEL INTERLOCK LOW	6-8
S21FIL FRONT DOOR INTERLOCK LOW	6-1
S22CIL COVER INTERLOCK LOW	6-2
S23INTERLOCK OVERRIDE LOW	6-7
S24 to S26 not used	

S27CSW COUNTER SWITCH	6-6
S28COM COMPRESSOR	6-7
S29VPM VACUUM PUMP MAGAZINE	6-5, 6-7
S30VPC VACUUM PUMP CASSETTE	6-5, 6-7
MISCELLANEOUS	
AIR RESERVOIR	6-3
CASSETTE CENTERING BAR	6-2, 6-3
CASSETTE OPENER	6-2
CONVEYOR ML700	6-2, 6-4
CONVEYOR TUNNEL	6-8
DISPLAY	6-1
FILM POCKET	6-4
FRAME	6-4
FUSES	6-1
MAGAZINE HOLDER	6-1, 6-3
POWER SUPPLY	6-7
SERVICE KEYPAD	6-1
TUNNEL	6-8
WATER TRAP	6-3

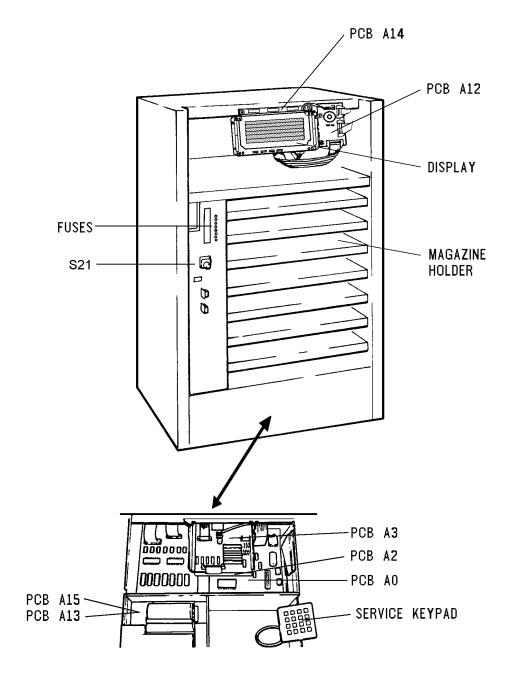


figure 6-1

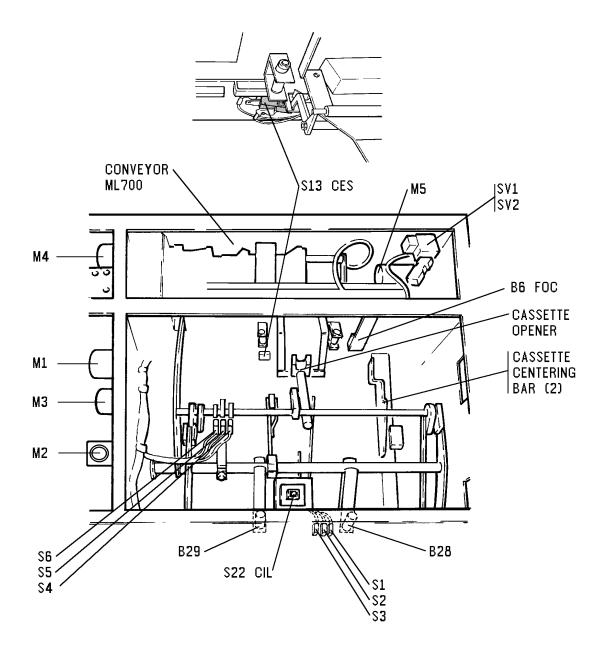


figure 6-2

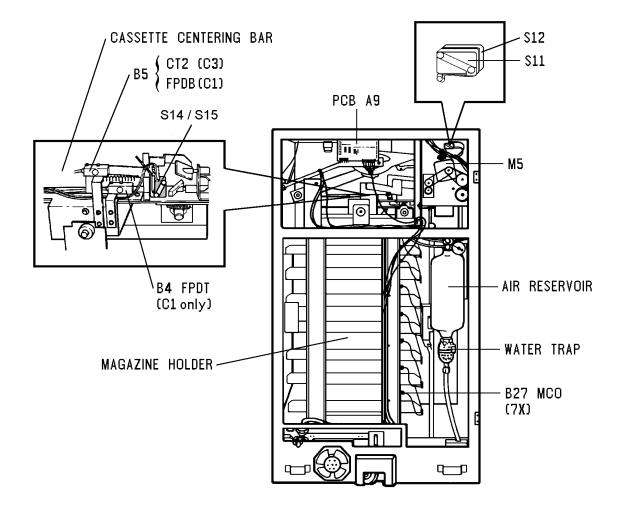


figure 6-3

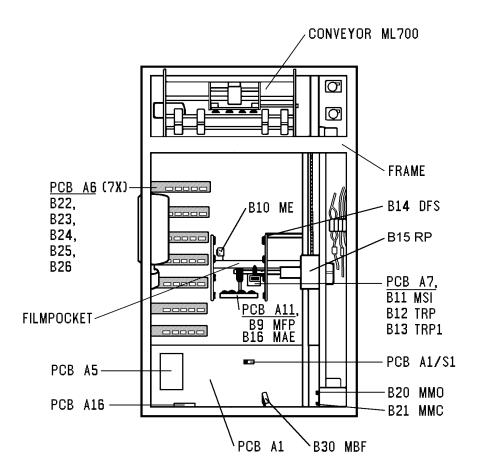


figure 6-4

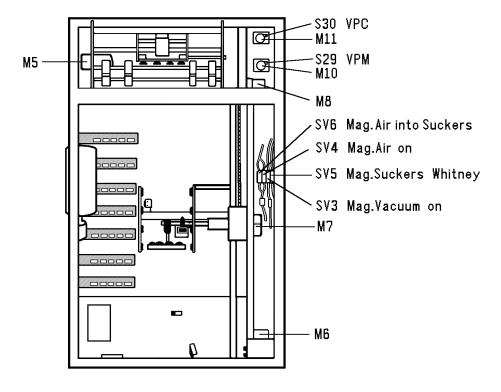


figure 6-5

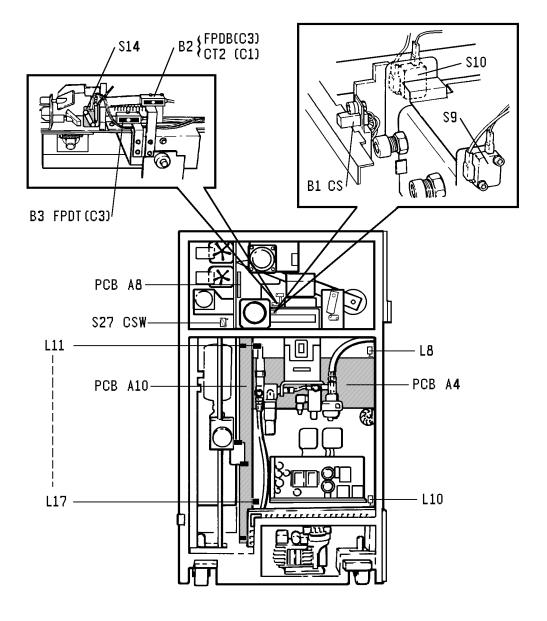


figure 6-6

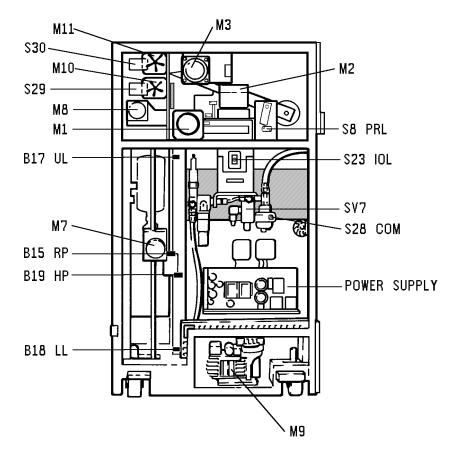


figure 6-7

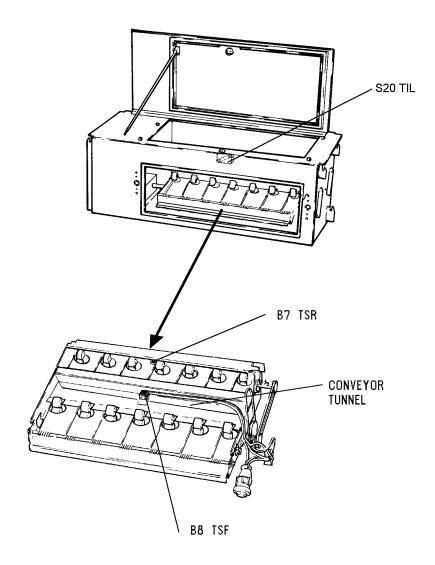


figure 6-8

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